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**QUALITY OF OBSTETRIC CARE IN
INDIA'S JANANI SURAKSHA YOJANA
CASH TRANSFER PROGRAM TO
PROMOTE FACILITY BIRTHS: STUDIES
FROM MADHYA PRADESH PROVINCE**

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Quality of obstetric care in India's Janani Suraksha
Yojana cash transfer program to promote facility births:
Studies from Madhya Pradesh province

THESIS FOR DOCTORAL DEGREE (Ph.D.)

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It is the ethical dimensions of individuals that is essential to a system's success. Ultimately, the secret of quality is love. You have to love your patient, you have to love your profession, you have to love your God. If you have love, you can then work backward to monitor and improve the system. – Donabedian A

ABSTRACT

Background: Improving maternal health remains a challenge in most of the developing countries. In-facility births is an accepted strategy to reduce maternal mortality. India, which accounts for 17% of global maternal deaths, had a high proportion of home births- 65.5% in 2005. With encouraging evidence in the early 2000, cash transfer programs are increasingly gaining popularity as measures to increase utilization of health services. In 2005, India, under its National Rural Health Mission (NRHM), launched the Janani Suraksha Yojana (JSY) cash transfer program that pays cash to women on delivering in health facilities. The underlying assumption was that birth in a facility would provide women access to skilled birth attendance (SBA) and emergency obstetric care (EmOC), thus reducing maternal mortality. Along with the JSY, the NRHM also undertook initiatives to improve services, including training staff in skilled birth attendance, the provision of emergency transportation services, and facility infrastructure upgrades. The JSY, which has had over 80 million beneficiaries, has been successful in raising the proportion of facility births to 74.4% in 2013. However, the steep rise in facility births has not translated into a commensurate decline in maternal mortality ratio. Quality of care in the JSY program, although crucial to improved outcomes, has remained less researched. **Aims and objectives:** This thesis studied the quality of obstetric care provided at facilities implementing the JSY cash transfer program in Madhya Pradesh (MP) province, India by way of (i) assessing the competence of nurse midwives at providing first line EmOC (I), (ii) assessing the quality of obstetric referrals (II), (iii) determining the implementation fidelity of partograph use for monitoring labour (III), and (iv) assessing the quality of routine intra-partum care (IV). **Methods:** The studies employed both quantitative (I, II, III) and qualitative (III, IV) methods. Data collection methods used were written case vignettes administered to nurse-midwives (n=233) (I, III), cross-sectional survey of post-partum women in health facilities (n=1182), maternal death record review (n=124) (II), case record review (n= 1466) (III), interviews with providers (n=11, 10) (III, IV) and observations of vaginal deliveries (n=18). Quantitative data were analysed using descriptive statistics (I, II, III), and conditional logistic regression to study association between maternal referral and adverse birth outcomes at term delivery in the matched case control design (II), while spatial data for referrals was analysed using buffer analysis in Geographical Information System (II). Thematic framework approach was used for analysis of qualitative data (III, IV). **Results:** The competence of nurse-midwives at providing first line EmOC was low- 75% of participants scored below 35% of the full score. Overall 14% of participants in the vignette survey were competent at assessment, 58% were competent at making a correct clinical diagnosis, and 20% were competent at providing first-line care. Referral patterns in paper II showed secondary level facilities received few referrals, while referrals were made directly to district hospitals. Prolonged labour was the commonest reason for referral (39%). Adjusted odds for adverse birth outcomes were twice among those referred than those not referred (AOR 2.6, 95% CI 1.1-6.6) (II). Spatial analysis of transfer time from sending to the receiving CEmOC facility among in-facility maternal deaths showed 98% of the deceased mothers were referred from facilities within the desired 2 hour transfer time, indicating high number of maternal deaths despite good geographic access (II). Of the 1466 records reviewed, only 6 % had a filled partograph. Competence at plotting a partograph was poor - 75% participants scored below 15% of the full score. Analysis of the data from interviews regarding partograph use revealed partographs were used rarely and retrospectively, training does not support correct use of the partographs, and partographs can be useful but are not feasible (III). Observations in paper IV revealed unfavorable delivery environment such as delivery rooms were not conducive to safe, women-friendly care provision, and coordination between providers was poor. Staff do not provide skilled care routinely as known from observations that monitoring was limited to assessment of cervical dilatation, lack of readiness to provide key elements of care, and the execution of harmful/ unnecessary practices coupled with poor techniques. Care provision was characterized by dominant staff and passive recipients - staff sometimes threatened, abused, or ignored women during delivery; women were passive and accepted dominance and disrespect. The interviews revealed providers' awareness of the compromised quality of care, but they were constrained by structural problems. Positive practices were also observed, including companionship during childbirth and women mobilizing in the early stages of labour. **Conclusions:** Findings from studies conducted in MP province indicate that the quality of care in the JSY program requires improvement. A key opportunity to translate large gains in coverage of in-facility births achieved through the JSY cash transfer program into reductions in maternal mortality is currently lost owing to deficiencies in the quality of care provided. Quality of care can be improved by addressing problems with training, supervision and ensuring a conducive environment for quality care provision. Cash transfer programs aiming to raise demand for services should ensure the services provided are of good quality in order to achieve intended outcomes.

Key words: Quality of care, cash transfer program, maternal mortality, skilled birth attendance, midwifery

PREFACE

This thesis, although studied in the recent four years, is the reflection of my learnings in health over the last decade.

Being born and brought up in rural Maharashtra, India, I have experienced the joy of rural living and also witnessed the extremes of deprivation and disadvantage that come along. Although I was sent to the best school in the place and always topped every class, my parents and teachers always imbibed on me to keep doing the best possible in the given situation and not worry of the outcomes; so the results of hard work at studying were never so much exciting to me since the runner ups and competitors were none than my best friends including my own brother. That is probably when I grew passionate about doing the best regardless of the achievements and learnt that success could be short lived but the joy of trying well is lasting.

The years of higher education were life changing in many ways. While I always aspired to join the defense medical services, the failure to occupy a place in the few seats for girls left me wandering to figure the career path to take while experiencing the challenges women students from rural backgrounds face when competing with the urban and privileged ones. I joined training in Indian medicine (Ayurveda) in a government college in Pune city in Maharashtra and those were the years I probably learnt as much from talking to the patients and reading non academics as much as from the classes. The college is known to the best of its kind, but the education failed to sustain my interest in medicine; I was rather more attracted to understanding the social causes of ill health. I had more questions from my encounters with multifaceted problems as I worked at various public facilities as a trainee doctor, I struggled to understand the functioning of the public sector the way it did whilst getting a close view of the lives of staff, especially nurses, who strive to keep it going. My practical lessons in obstetrics came from working with two role models- Dr. N. Chakraborty, who taught me to put the patients first and aim for nothing less than the best quality care for each patient and Late Dr. U. Shidhaye who practiced the best obstetrics in very rural settings. This was the time when I got my hands on the report on alternative strategies for health in India, and meeting the person who was one of the visionaries of this report was a turning point in my life- Dr. N. H. Antia, a plastic surgeon par excellence who devoted his life to working for tuberculosis and leprosy and then to public health. The three years that I worked with him, though the last years of his life, were eye opening for me in many ways. It was those years of working with rural women and community health programs, unlearning some of the medical school teachings, breaking the set hierarchies in doctor-patient relationships that I understood medicine might be simplified with training and protocols but indeed how complex health is, it is also a political and social science. I made the best of every opportunity to visit places seeking to meet and learn from the fascinating people who sacrificed many worldly luxuries to do what needs most to be done for peoples' health. Following my pursuit to know more of the ways public services could be improved to fulfill their roles, I took to masters in hospital and health systems management from one of the best schools in India only to realize many simple solutions that could do wonders are known; however the hard part probably is of the willingness and leadership to put these to practice. The close interactions with community health workers I worked with in Ralegan Siddhi village, while witnessing the development work by social reformer Anna Hazare has had a changing impact on me along with several discussions with Dr. Nerges Mistry, Dr. Rakhil Gaitonde, Dr. B Subha Sri and Brig. R S. Rajan over these years. These were the years I got the company of a very amazing person- Dr. Bharat Randive, who has been the best comrade on this voyage of learning and reflecting. My visits to numerous health facilities in various parts of India brought me opportunities to interact with a range of providers serving in challenging conditions and with users loaded with hopes from them.

My pursuit for higher education in health systems research brought me to use the opportunity on the MATIND project that I came across through my mentor Prof. Dileep Mavalankar. The exposure to Swedish systems and the training experience during the PhD education have been enriching, importantly directing to ask the right questions. This research might only be a very small contribution to change anything for the women in rural India, but indeed has changed my world view, made me more passionate for quality in the smallest of deeds while recognizing that there are no magic bullets to achieve best service quality for all.



LIST OF SCIENTIFIC PAPERS

- I. **Chaturvedi, S., Upadhyay, S., & De Costa, A. (2014).** Competence of birth attendants at providing emergency obstetric care under India's JSY conditional cash transfer program for institutional delivery: an assessment using case vignettes in Madhya Pradesh province. *BMC Pregnancy and Childbirth*, 14(1), 174.
- II. **Chaturvedi, S., Randive, B., Diwan, V., & De Costa, A. (2014).** Quality of obstetric referral services in India's JSY cash transfer programme for institutional births: a study from Madhya Pradesh province. *PLoS One*, 9(5), e96773.
- III. **Chaturvedi, S., Upadhyay, S., De Costa, A., & Raven, J. (2015).** Implementation of the partograph in India's JSY cash transfer programme for facility births: a mixed methods study in Madhya Pradesh province. *BMJ Open*, 5(4), e006211.
- IV. **Chaturvedi, S., De Costa, A., & Raven, J. (2015).** Does the Janani Suraksha Yojana cash transfer programme to promote facility births in India ensure skilled birth attendance? A qualitative study of intrapartum care in Madhya Pradesh. *Global Health Action*, 8:27427.

These papers will be referred by their roman numerals (I-IV) in the text.

LIST OF OTHER RELATED PUBLICATIONS

1. **Chaturvedi,S.**, Raven, J. (2015).Re: WHO vision for quality of care for pregnant women and newborns: a welcome initiative .BJOG: An International Journal of Obstetrics and Gynaecology (Accepted).
2. **Chaturvedi, S.**, Randive, B., Raven, J., Diwan, V., De Costa A. (2015).Record review study of obstetric case records in India's JSY cash transfer program in Madhya Pradesh. Int J Gynecol Obstetrics (Accepted).
3. **Chaturvedi, S.**, Ali, S., Randive, B., Sabde, Y., Diwan, V., & De Costa, A. (2015). Availability and distribution of safe abortion services in rural areas: a facility assessment study in Madhya Pradesh, India. *Global Health Action*, 8:26346.

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LIST OF ABBREVIATIONS

ASHA	Accredited Social Health Activist
CCT	Conditional Cash Transfer
CEmOC	Comprehensive Emergency Obstetric Care
CHC	Community Health Centre
COPASAH	Community of Practitioners for Accountability and Social Action in Health
DH	District Hospital
EmOC	Emergency Obstetric Care
GIS	Geographic Information System
GOI	Government of India
ICM	International Confederation of Midwives
INR	Indian Rupees
JSY	Janani Suraksha Yojana
LMIC	Low-Middle Income Country
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
MoHFW	Ministry of Health and Family Welfare
MP	Madhya Pradesh
NHSRC	National Health Systems Resource Centre
NRHM	National Rural Health Mission
PHC	Primary Health Centre
SBA	Skilled Birth Attendance
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
UNICEF	United Nations Childrens Fund
WB	World Bank
WHO	World Health Organisation

1 INTRODUCTION

Pregnancy and motherhood are generally occasions of happiness to women and their families. However, for various reasons many women die or undergo suffering during and following pregnancy and childbirth, majority of them from the low and middle income countries (LMICs). Improved scientific knowledge and the availability of modern technology have brought several significant successes in global health over the past five decades but maternal mortality reduction remains a serious challenge in the majority of LMICs. Maternal mortality is considered to be the greatest inequity of the 21st century with 99% of maternal deaths occurring in the developing countries. The maternal mortality ratio (MMR) in developing regions was 14 times higher than developed ones in 2013 (World Health Organization, 2014a). Improving maternal health and reducing maternal mortality have been prioritized in several national policies and international declarations including the Millennium Development Goals (MDGs). However the MDG 5- to reduce maternal mortality by three quarters between 1990 and 2015 has made the least progress of all the MDGs.

India loses a large number of young women owing to maternal deaths; with 50,000 maternal deaths in 2013, India contributed 17% of the global burden of maternal mortality (World Health Organization, 2014a). It has achieved a significant decline in the MMR from 437 maternal deaths/100,000 live births in 1990 to 178 in 2010–12 (Registrar General of India, 2013). Nevertheless, India is still far away from reducing it to 109 maternal deaths per 100,000 live births, which is the MDG 5 target for the country.

In 2009, the United Nations Human Rights Council (UNHRC) accepted that preventable maternal mortality is a human rights challenge and highlighted the right to life and to enjoy the highest attainable standard of physical and mental health, including sexual and reproductive health (United Nations Human Rights Council, 2009). In-facility births is now the accepted strategy to reduce maternal mortality as most maternal deaths are in the peri-partum period and can be prevented with facility births that provide access to skilled birth attendance (SBA) and appropriate emergency obstetric care (EmOC) when required. Preventable maternal mortality is not simply an issue of access to health services during pregnancy and childbirth, but importantly access to services of acceptable quality. Even with universal access to maternal health services, preventable maternal mortality can persist if the services are not of an acceptable standard. Though quality of care is crucial to preventing maternal mortality, it often receives less attention than coverage of services. A focus on quality of maternal health care is now considered a global imperative (Graham et al., 2012). With encouraging evidence in the early 2000, cash transfer programs are increasingly gaining popularity as measures to increase uptake of health services and schooling. In 2005, India launched a large cash transfer program –the Janani Suraksha Yojana (JSY) to promote facility births. The success of the JSY at increasing facility births in India is highly recognized- raising these from 34.5 % in 2005 to 74.4 % in 2013; however less is known of the quality of care provided during facility births under the JSY program. This thesis explores quality of obstetric care in Madhya Pradesh (MP) province in central India in the context of the large cash transfer program- the JSY to promote facility births. It is based on four sub-studies conducted in the province using quantitative and qualitative research methodologies.

The thesis starts by presenting an overview of maternal health initiatives globally and in India followed by that of cash transfer programs and the JSY. Then the health system context in which studies in this thesis were conducted is described, followed by frameworks for quality of care. This is followed by chapters on study justification and the objectives of the present research. The following chapter focuses on the study setting and the methods along with the ethical considerations. The fifth chapter describes the main results and findings from this research. The sixth chapter presents the discussion locating the findings within the framework for quality of facility births in the context of the JSY cash transfer program in the Indian province of Madhya Pradesh. The last chapter of the thesis presents conclusions and areas for further research.

1.1 MATERNAL HEALTH- GLOBAL INITIATIVES AND SCENARIO

In 1984, the World Health Organisation (WHO) released maternal mortality estimates for the first time. The Safe Motherhood Inter-Agency Group of UN agencies including United Nations Development Programme (UNDP), United Nations Population Fund (UNFPA), United Nations Children's Fund (UNICEF), WHO, World Bank, International Planned Parenthood Foundation (IPPF) and Population Council was established in 1987, which launched the global campaign to reduce maternal mortality (Starrs et al., 2006). The initial strategies of the campaign were focused on community based interventions such as training of traditional birth attendants (TBAs) to improve delivery of care at community level and screening pregnant women to identify those at risk of complications through ante natal care. Subsequently in 1999 the WHO stated that 'there is no reason to believe that TBA training can contribute to MMR reduction in isolation' (World Health Organisation, 1999). With this evidence, focus was shifted to increasing women's access to professional care- SBA and EmOC. In 1999, the WHO with UNFPA, UNICEF and World Bank called on countries to "ensure that all women have skilled care during pregnancy, childbirth and immediate postnatal period" (World Health Organisation, 1999). In 2000, maternal and child health related goals were included in the MDGs (United Nations, 2000). The currently recommended strategy for maternal health is a health facility based strategy with intrapartum care by skilled birth attendants supported by referral services for EmOC, if required (World Health Organization, 2005; Ronsmans et al., 2006; Starrs et al., 2006; Campbell et al., 2006). Skilled attendance at birth implies care is provided by competent personnel in settings adequately equipped to provide appropriate care for normal deliveries and manage complications. (World Health Organisation, 2004). With global efforts in the last decade to reduce preventable maternal and newborn mortality focusing on skilled birth attendance (SBA), the proportion of births by skilled providers in developing countries has increased from 56% in 1990 to 68 % in 2012 (United Nations, 2014). There has been a shift to facility births, globally women are deciding against home births in LMICs, although the shift does not appear to be as high in proportion as expected with two decades of efforts to improve maternal health (Johnson et al., 2013).

In 2000, the global community declared a three quarter reduction in MMR by 2015, from the levels in 1990, as the fifth Millennium Development Goal (MDG 5). This declaration brought increased global attention to improving maternal health. The recent reviews of progress to MDGs revealed that the MMR decreased by 45% globally between 1990 and 2013; however in many countries the progress towards achieving MDGs is off track (World Health

Organisation, 2014a; Hogan et al., 2010; Clemens et al., 2007; Hussein et al., 2008; Starrs et al., 2006). The latest estimates show global MMR in 2013 was 210, however in the global north (16) it was 14 times lower than in the global south (230). Estimates show the number of women who died due to maternal causes in 2013 was 289,000 globally and 99% of these were concentrated in the global south. Southern Asia contributed 24% to this global burden of maternal deaths (World Health Organisation, 2014a). Even among the survivors, the burden of acute and chronic clinical and psychological morbidity is high and adversely affects the women, newborns and their families (Koblinsky et al., 2012).

Recent global initiatives for maternal health include the 'Ending Preventable Maternal Mortality' report by the WHO and partners and the 'Every Newborn Action Plan' released in 2013-14 (World Health Organisation, 2014b). These provide the potential approach for countries to adopt in order to improve maternal and newborn survival and health. The global community is preparing the global strategy for Women's, Children's and Adolescent's Health (2016-30) for the post 2015 era of Sustainable Development Goals.

Despite the efforts and commitments from governments and donor agencies, there remain challenges in leadership, governance, health systems, funding and overall coordination globally. Very few countries have the necessary resources and support to fully implement strategies for universal access to key obstetric interventions.

1.2 MATERNAL HEALTH – INITIATIVES AND SITUATION IN INDIA

Maternal health in India is under the purview of the ministry of health and family welfare (MoHFW). The ministry has historically had several shifts in focus with regard to reproductive health. There were various programs with features as listed in Table 1. The MDG target for India was to reduce the MMR to 109 maternal deaths per 100,000 live births by 2015. In an ambitious step the Indian Government declared to reduce this to 100 maternal deaths per 100,000 live births by 2010. Since 2000, the Government adopted three major policies- the National Population Policy (2000), the National Policy for Empowerment of Women (2001) and the National Health Policy (2002), all of which endorse the set target to reduce MMR. (Ministry of Health and Family Welfare, 2000; Ministry of Women and Child Development, 2001; Ministry of Health and Family Welfare, 2002).

Table 1: Maternal health programs in India

Program	Duration	Focus/features	Evaluation findings/recommendations
Child Survival and Safe Motherhood program (CSSM) (World Bank, 1997)	1992-97	Community based maternity care Activities- screening of high risk pregnancies, safe delivery services at home through training of traditional birth attendants (TBAs) and provision of clean delivery kits	CSSM program succeeded at expanding focus of family welfare program from exclusively on fertility regulation to maternal and child health. Lack of effective service delivery including functional referral care limited program achievements. (World Bank, 1997)
Reproductive and Child Health –Phase I (RCH-I) (World Bank, 1997)	1998-2004	Paradigm shift from population control to reproductive health , mentions life cycle approach'; shift from community based births to health facility births Efforts to ensure essential obstetric care and EmOC through strengthening health facilities and transport facilities, improving first referral units and blood transfusion services	Some improvements in facility births, mostly in better off states. Health systems continued to have critical deficiencies including specialists for EmOC and blood availability. Maternal and child health indicators remained unacceptably high (World Bank, 1997).
Reproductive and Child Health – Phase II (RCH-II)	Ongoing since 2005	Emphasis on facility births Focus on skilled birth attendance (SBA) Infrastructure strengthening for basic and comprehensive EmOC through reforms under the NRHM Capacity building for SBA- training of nurse-midwives for SBA, task shifting – general physicians trained for anaesthesia for EmOC and for Caesarean section Raising demand for facility births- the JSY cash transfer program offering incentives to women and to ASHAs	

The MMR for India reduced from 437 to 178 per 100,000 live births between 1990-91 and 2010-12 (Figure 1). This equates to a 59% decline in MMR during this two decade period; inspite of this progress, India has a far way to go and is unlikely to achieve its MDG5 target. The national averages for health indicators in India hide the stark regional differences within the country- for example the MMR varied from 328 in Assam to 66 in Kerala (Registrar General of India, 2013) (Figure 2). The major causes of maternal deaths in India are direct obstetric causes - haemorrhage (38%) is the leading cause followed by sepsis (11%), unsafe abortion (8%), hypertensive disorders (5%) and obstructed labour (5%) (Registrar General of India, 2006). However there is no data available on causes of maternal deaths subsequent to this 2006 report that refers to the period 1997-2003.

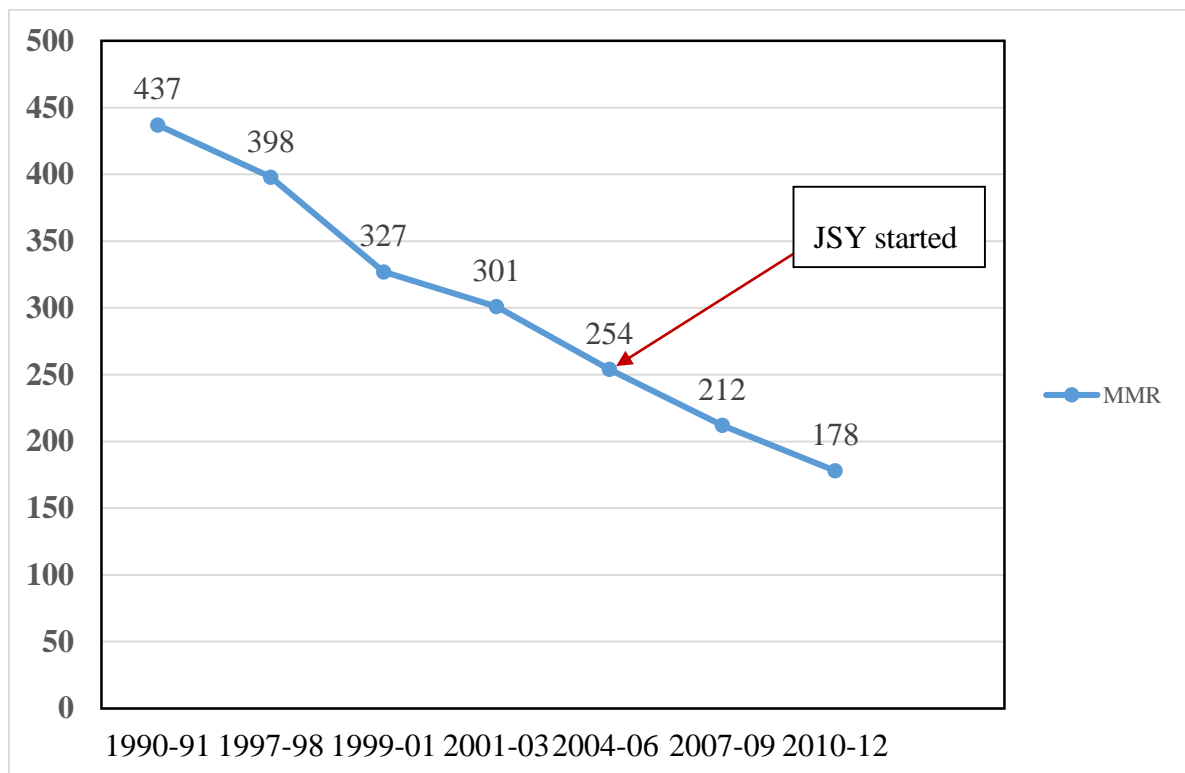


Figure 1: Maternal mortality trends in India 1990-2012

Source: Sample Registration System, Government of India

The situation in India is of underuse of essential interventions in some groups while overuse in others- for example the District Level Household and health facility Survey (DLHS) 2007-08 reports an overall caesarean section rate of 8.5%, but it is 1.5% among the rural women in poor areas and 32.1% among the wealthier women in urban areas; this rate is 2.3% in Nagaland but 31% in Kerala (International Institute for Population Sciences, 2010). The UNICEF 2009 coverage evaluation survey reported a caesarean rate of 12.4% in government hospitals compared to 34.6% in private hospitals (UNICEF, India, 2010).

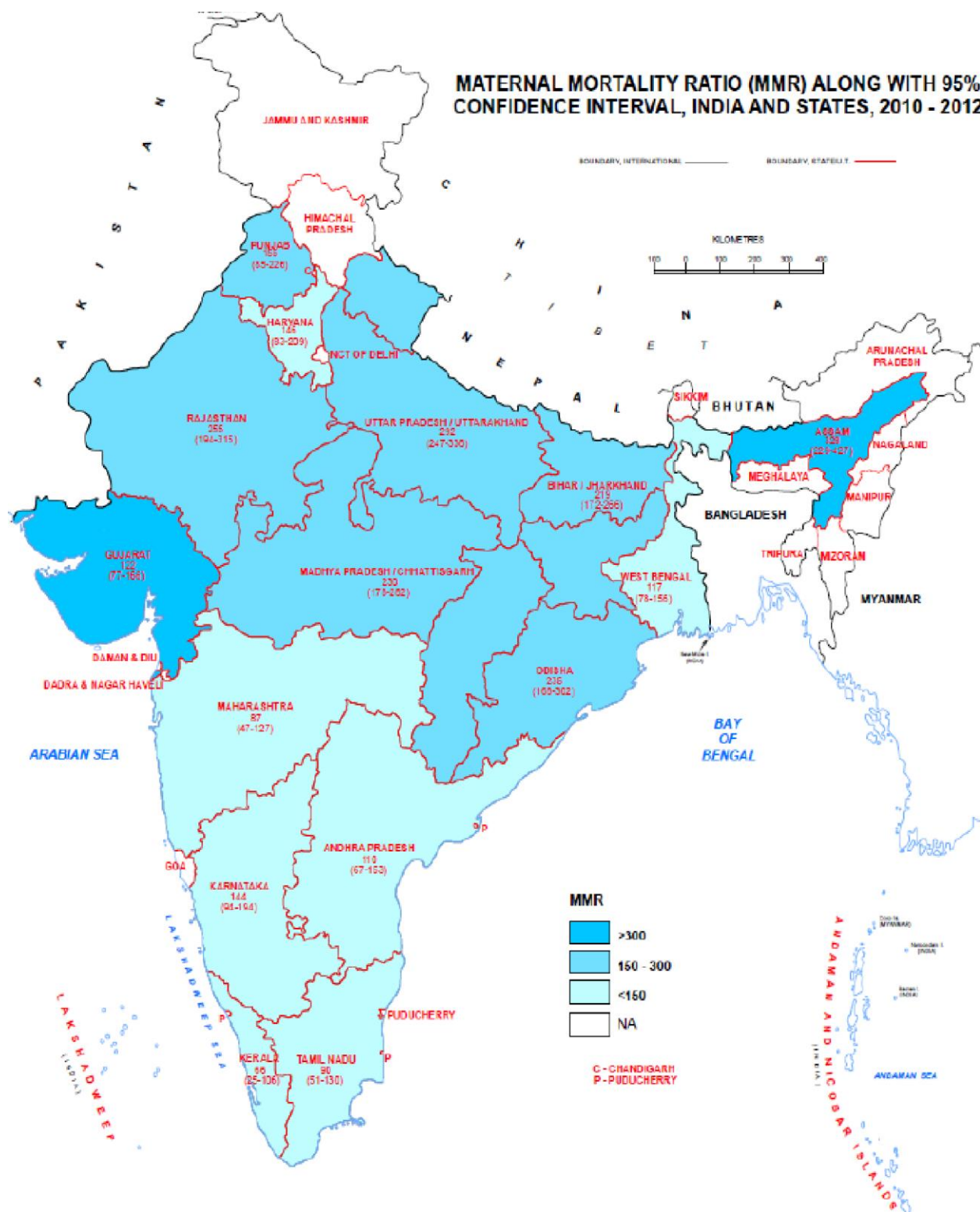


Figure 2: Map of India showing variation in maternal mortality ratio among states

Source: Sample Registration System. Government of India, New Delhi

As regards the utilization of health services, the findings of the DLHS 2007-08 (International Institute for Population Sciences, 2010) show poor uptake. Only 18.8% women received full antenatal care as prescribed by the Indian government that includes at least three ante natal checkups, tetanus toxoid injection, and consumption of adequate dosage of iron folic acid

supplement. The survey reports only about half (49.7%) women received post-natal care within two weeks of delivery. During the last decade there was sudden shift in place of birth; facility births increased from 34.5% to 74.4% between 2005 and 2013. Within country substantial increase in proportion of in facility births was observed however socioeconomic inequalities in accessing in facility care for childbirth still exist. The sudden increase in facility births in India was following the large scale conditional cash transfer program- Janani Suraksha Yojana (JSY) initiated by the Indian Government to promote facility births.

1.3 CASH TRANSFER PROGRAMS AND THE JANANI SURAKSHA YOJANA:

Conditional cash transfer (CCT) (Fiszbein et al., 2009; Marshall and Hill 2014; Valencia 2008) programs provide monetary benefits to poor people against certain conditions. These conditions are mainly focused on improving desirable behaviours like children's school attendance and uptake of preventive health behaviour such as vaccination of children, antenatal check-up and delivery in health facility. The CCTs were begun with the principle aim of poverty alleviation with the help of direct transfer of money to poor households. Apart from this primary aim, CCT programs also contribute to building human capital by encouraging improvement in education and health of poor people through the conditions they apply. The CCT programs predominantly started in Latin America in 1990, including in Mexico, Brazil, Colombia, Honduras, Nicaragua and Ecuador and later have become popular in many other developing countries over the last decade. Brazil's Bolsa Familia (Lindert et al., 2007) and Mexico's Oportunidades (Fernald et al., 2008) which cover millions of households are examples of large CCTs among the many others. CCT has been promoted as a policy tool to address inequality and prevent transmission of poverty from one generation to another. In addition to this, CCTs have been used to address gender disparities in South Asian countries where girls' schooling lags much behind that of boys.

Global efforts to understand the usefulness of CCTs have created a rich body of knowledge, yet there are many unanswered questions. The evaluations of CCTs so far have identified that these are largely successful in raising school attendance and utilization of health services along with poverty reduction. However, apart from this evidence of the success of CCTs at increasing utilization, their long term impact on education and health outcomes has been less clear (Lagarde et al., 2007; Baird et al., 2013; Fiszbein et al., 2009). There are many factors which determine the success of a CCT program at achieving its goal. These include the design of the CCT program, amount of the transfer offered, duration of the program, targeting efficiency and transparency. Apart from these factors, the context in which the CCT program is implemented plays an important role. For instance to achieve health outcomes by increasing utilisation of health services through a CCT program, availability and good quality of health services in the program are essential. If health services are not adequately available or quality of services provided is poor, CCT is unlikely to achieve improved health outcomes. Thus CCTs can only stimulate demand for health or education, however availability of good quality supply side is a prerequisite for a CCT program to succeed at improving outcomes. A recent overview of five CCT interventions for maternal health in South Asian countries- India, Pakistan, Bangladesh and Nepal found increased utilisation of services but lack of evidence of improved maternal health outcomes and suggested a need for improved quality of care (Jehan et al., 2012).

Indian government started a nationwide CCT program called JSY (Ministry of Health and Family Welfare, 2006) that pays cash to women on delivering in health facility. Although the JSY is not a typical form of CCT aimed at poverty alleviation, it is based on the principles of CCT i.e. cash for healthy behaviour. The JSY has been a flagship program of the National Health Mission in India (more details about the Mission are provided in the following section). The Mission launched the JSY program in 2005 with the goal of reducing maternal and neonatal mortality. Monetary incentive paid to beneficiaries varied based on performance of the province (state) at the time of program initiation. In states having low levels of facility births (low performing states), the JSY program provides a cash incentive of INR 1400 and INR 1000 to rural and urban women respectively if they give birth in a public or accredited private health facility. Whereas in high-performing states, the cash incentive is about half that paid out in the low performing states and is restricted to women from families living below the poverty line (BPL) and from socially disadvantaged communities. Along with the JSY, community health workers called Accredited Social Health Activists (ASHAs) have been appointed in each village. The ASHAs are encouraged to motivate women to go to health facilities for childbirth care. They are paid an incentive (INR 600) to escort women to public facilities for childbirth. The incentive for the ASHA includes costs for arranging transport to facility. The JSY benefit was initially restricted upto two childbirths and women above 19 years of age in some states. These conditionalities were opposed by advocacy groups in the country and were subsequently removed. Although in the earlier years of the JSY, the conditionality for receiving the incentive included completion of full antenatal checkup, it was hardly put to practice for feasibility reasons and now no longer exists as a conditionality. Another condition is a mandatory 48 hour stay at the facility after the delivery, this is practiced to some extent however, majority of women prefer to go back home earlier.

The JSY is one of the largest CCT programs with 80 million beneficiaries since inception (Ministry of Health and Family Welfare, 2015). There has been a sharp increase in facility births in the post JSY period, however results of evaluations of the JSY to study impact on maternal mortality are not encouraging. Lim et al. in their evaluation based on the data in early years of the JSY were unable to detect an impact on maternal mortality (Lim et al., 2010). A subsequent evaluation by Mazumdar et al. found the cash incentive did not improve neonatal mortality and reported some unintended consequences such as increase in fertility (Mazumdar et al., 2012). Randive et al. detected no association between the proportion of facility births and MMR in nine low performing states of India (Randive et al., 2013). There is no clear evidence with regard to effect of JSY on reducing socioeconomic inequalities in utilization of facility based care for childbirth. An early evaluation of JSY reported that women from the poorest households and those with least education did not always have the highest chance of receiving the JSY cash incentive (Lim et al., 2010). No significant differences between the rates of facility births among poor and non-poor populations were reported by another study (United Nations Population Fund India, 2009). A study in Central India reported a small increase in the proportion of deliveries from the lower socioeconomic population amongst hospital deliveries, however these results were not based on population level data (Gupta et al., 2012). A recent study which examined the change in economic inequalities in utilization of health facilities for childbirth demonstrated that although inequality has reduced to some extent, it exists even during JSY (Randive et al., 2014).

1.4 THE HEALTH SYSTEM IN INDIA:

After her independence in 1947, India adopted a welfare state approach committing to providing health care to all citizens through constitutional directive principles (Kashyap 1994). India has a federal governance structure with distribution of powers and responsibilities between the central and provincial (state) governments. The Central Government plays a catalytic role in aligning the states' health programs to meet certain national health goals through various policy guidelines as well as financing certain components of centrally sponsored programs implemented by the state governments.

The health system in India consists of the public sector, the private for profit and the private not-for-profit sector. The public health system is three-tiered including primary, secondary and tertiary level facilities. The private for profit sector is heterogeneous and varies in size and composition amongst the provinces while the private not-for profit sector is relatively small.

The norms for the public health system structure are defined by the National Health Policy 1983. The Table 2 below shows the prescribed and current coverage of public health facilities. As of March 2012, India had 24,094 primary health centers (PHCs) and 4,833 community health centers (CHCs) (Ministry of Health and Family Welfare, 2012).

The norms for facilities are as shown in Table 2 , however all facilities do not provide the services at the expected level -many CHCs provide primary level care while district hospitals(DHs) provide only up to secondary level care and there are much variations in population size covered by facilities. The medical colleges serve as apex institutions generally located at major cities. Of the 387 medical colleges in the country, 181 are in the government sector while rest are owned by the private sector. Although India supplies some of the best medically trained human resources to many countries, including the developed ones, there is a huge shortage of these resources in the public system in the country. Each year the education institutes produce a number of personnel- 30,000 physicians, 18,000 specialists, 30,000 graduates of Indian Systems of Medicine, 54,000 nurses, 15,000 auxiliary nurse midwives (ANMs) and 36,000 pharmacists; however the current doctor-population ratio is 0.5 doctors per 1,000 population, whereas the WHO suggests a ratio of 1 doctor per 1,000 population. Although the Government of India aims to raise this ratio to 0.8 doctors per 1,000 population by the year 2025, the Medical Council of India (MCI) believes that this ratio will not be achieved before the year 2031 (Ministry of Health and Family Welfare, 2012). There is a shortfall of 23% nursing personnel at primary and secondary health facilities against the required numbers (Ministry of Health and Family Welfare, 2012). Apart from shortages of staff and supplies public services are characterized by absenteeism, more so in rural areas compared to urban areas, and lack of adequate oversight and control.

In the private sector, there is diversity and hierarchy in the institutional composition of the for profit sector consisting of a range of informal practitioners, clinics, small and large nursing homes, corporate hospitals, diagnostic centers and pharmacies (Baru et al., 2010). In the private sector, the informal practitioners provide primary level services in rural and urban areas and constitute the largest proportion in terms of numbers and spread. The secondary level consists of small and large nursing homes that are mostly owned by physician entrepreneurs and provide outpatient and inpatient services. The majority of these are small institutions, with 85% having less than 25 beds.

Table 2: Structure of public health system in India

Facility	Staff	Infrastructure and expected services	Population coverage (prescribed)	Current population coverage (average)
Sub health Centre	One Female Auxiliary nurse midwife (ANM) and one male multipurpose worker (MPW)	Two room building with basic facilities for outpatient care Preventive and promotive services including immunization ,outreach activities including antenatal care	5,000 (3,000 in hilly areas)	5,615
Primary Health Centre (PHC)	One medical doctor and 14 staff members including nurses, laboratory technicians and administrative staff	Facility with 6-10 beds for inpatient care Primary curative services, emergency and referral services	30,000 (20,000 in hilly areas)	34, 631
Community Health Centre (CHC)	Four specialist doctors (gynecologist, surgeon, anesthetist, pediatrician) and 21 other paramedical and administrative staff	Facility with 30-50 beds for inpatient care Secondary level curative services including surgical care Emergency and referral services	120,000 (80,000 in hilly areas)	172, 375
District Hospital (DH)	Specialist doctors and general physicians	Facility with 100-300 beds for inpatient care , with diagnostic, surgical care and blood banking Tertiary level care	One per district	

Tertiary specialty and super-specialty private institutions comprise only 1-2% of the beds in private sector institutions. They include large specialist hospitals promoted mostly by big business groups and managed as corporate houses. The secondary and tertiary hospitals are largely skewed towards urban areas and developed states (Government of India, 2006).The distribution of private sector facilities between states and regions is even more unequal than those in the public sector reflecting a trend towards concentration in better-off states and

regions within them (Baru et al., 2010). The private sector is highly unregulated and exorbitantly expensive for the majority of the population.

The health care financing in India is of a mixed type comprising a tax-based public sector providing free of cost or highly subsidized services, a privately funded private sector that largely includes the for-profit facilities and a smaller number of not-for profit facilities. This apart, out of pocket payments for health services are high in India with the public spending on health accounting for less than 20% of the total health spending. The poorer sections of the population also choose to access services from the private sector, although expensive, perhaps due to the perceived poor quality of care in the public sector. A very small portion of the population has health insurance coverage- either public, private or through community based schemes (Ministry of Health and Family Welfare, 2005a). Reports show that about one fourth of hospitalized individuals are likely to be pushed below the poverty line owing to hospital expenses (Ministry of Health and Family Welfare, 2005b).

The health system in India is also characterized by medical pluralism. Although the Western or allopathic system of medicine is predominant, the Indian and traditional systems of medicine including Ayurveda, Yoga, Unani, Siddha and Homeopathy are also popular. Folk medicine is popular among the indigenous communities.

The Indian situation is peculiar in that although the country has enjoyed an accelerated economic growth in the past two decades, it has fared poorly on human development and health indicators, even when compared with other countries and South Asia that have similar income and growth levels. Besides low population level indicators, there are inequalities along multiple axes as caste, class, gender and regions (Baru et al., 2010). Interstate (province) variations in public facilities and human resources are well known. Different parts of India are at different stages of health transition. Generally the northern states are in the demographic transition stage wherein mortality and fertility rates decline and some are in the epidemiological transition stage wherein disease patterns shift from communicable to non- communicable diseases while the southern states are undergoing the social transition where in people develop better ability to self-manage their health and have better knowledge and expectations from the health system. While Kerala, Maharashtra and Tamil Nadu are much higher in the trajectory, the populated states like Madhya Pradesh are in the early part. These interstate variations are explained by several factors including insufficient public investments and differences in the synergies between the role of the center and the states, and in the financing, provisioning and administration of health services.

Besides this variation, there are special health issues in areas populated by indigenous (called as tribal) people. Social and health issues are a special concern in areas ridden by internal conflicts and frequently affected by natural calamities.

In 2004, the then the newly elected United Progressive Alliance government announced its Common Minimum Program that included improving health services and a focus on revitalizing the public health system. Towards this, the government started an umbrella program- the National Rural Health Mission in 2005.

1.5 NATIONAL RURAL HEALTH MISSION (NRHM) IN INDIA:

The National Health Mission (NHM) was initially begun as National Rural Health Mission (NRHM) and subsequently the urban element was included in 2011 to form the NHM. The NRHM is the most ambitious health initiative launched in post independent India. The NRHM was conceived as a reform in the Indian health system with planned ‘architectural corrections’ in the system. The goal of the mission is to improve availability of, and access to, quality health care to the people, especially those living in rural areas, poor, women and children. The NRHM was a central government’s initiative launched to meet key health goals, where India lagged behind and was considered off track in progress towards the MDGs. (Bajpai et al., 2004). The NRHM vision included raising the expenditure from 0.9% of Gross Domestic Product (GDP) to 2 to 3% and enabling the health system to handle the increased allocations effectively. The NRHM was received as an opportunity to revitalize the weakened public health system while some criticized it for shortcomings. The characteristics of NRHM that were thought to be distinct from previous efforts/strategies included focus on reducing regional imbalance by prioritizing the low performing states; enhancing capacity of the local self-governance institutions to implement and monitor health care programs; local and district level health planning through health action plans; strengthening health facilities to meet Indian Public Health Standards (IPHS), allocation of untied funds to health facilities, inter-sectoral coordination for water, sanitation, hygiene and nutrition, and integration of vertical programs. These approaches were thought to be important to address the challenges to system strengthening and thus were hoped to improve services especially for the rural poor. The NRHM also increased the number of personnel in the system like nurses and doctors in facilities, while also introduced some new cadre. Prominent among these is the ASHAs, who are rural village women trained to function as community health workers. The ASHA by design is a daughter-in law of the village, educated at least up to 8th class, selected by the local government (panchayat) and covers a 1000 population. ASHAs undergo a 23 day induction training covering basic orientation to primary health care. The country presently has .85 million ASHAs, one per habitation/village (Ministry of Health and Family Welfare, 2015a). The ASHAs are paid on performance basis, rather than a salary, for specific activities like immunization, escorting women to facilities for childbirth. The NRHM, for the very first time in the country, mentions of an area specific approach to financing and focus. The NRHM categorized states (provinces) in the country according to their development and health indicators- those performing badly and with poor indicators were termed as low performing states while the ones with relatively better performance were termed as high performing states. Special focus has been laid on low performing states including Madhya Pradesh. These states received higher amount of funds and technical assistance from the central government.

The NRHM constituted an independent budget which amounts more than half of the total allocation for health and family welfare in the country (Kapur, 2013). Another distinct feature of the NRHM has been its autonomous functioning. The NRHM funds were not routed through the usual flow from center to states but through specially formed bodies – state health societies at state and district levels.

Quality is one of the key areas of the NRHM .The components or initiatives under NRHM particularly hoped to positively affect conditions for provision of quality services including of maternal health were formation of quality improvement cells at various levels, execution of

maternal death reviews, skilled birth attendant training to staff, appointments of additional nurses and doctors, community involvement in monitoring of services through formation of Rogi Kalyan Samitis (RKS) and promoting community based monitoring (CBM) of services, establishment of a Health Management Information System (HMIS) and inclusion of public health management cadre through establishment of Program Management Units (PMUs) at various levels in addition to the increased funding and improved fund flow mechanisms. Under the NRHM, Indian Public Health Standards have been formed that prescribe uniform standards and norms for health services in terms of physical infrastructure, human resources, services provided, treatment procedures and behavior with patients. In its vision the NRHM defined three key elements of high quality maternal care-viz. skilled birth attendance, access to emergency obstetric and newborn care (EmONC) and efficient referral system for timely access to EmOC.

Although there were deviations from the planned, the NRHM was largely seen as partly successful at improving the delivery of certain health services. There have been few evaluations of the NRHM while some aspects have not been adequately evaluated. The periodic review reports of NRHM have highlighted the issues of human resource and infrastructural shortages almost in each report (Ministry of Health and Family Welfare 2015b).

1.6 QUALITY OF CARE – DEFINITION AND MEASUREMENT

With the global efforts to reduce maternal mortality directed towards increasing access to skilled birth attendance, there has been an increase in rates of facility births- from 56% in 1990 to 68% in 2012 globally. In this context, quality of care during facility births attains critical importance to success at reducing maternal mortality. Improving quality of care during facility births is advocated as an opportunity towards this goal. Similarly in the Indian context with steep rise in facility births during the JSY program, quality of obstetric care in the program is critical to reduce maternal mortality speedily.

While most stakeholders feel that improving quality of care is important, there is often disagreement on which components should be included in the definition of quality. Historically, quality of care has been defined at a clinical level and involves offering technically competent, safe and effective care. However there is growing recognition that quality of care may be defined and measured differently (Ovretveit, 2001; Ovretveit, 1992). Definitions of quality of care could vary according to stakeholders' priorities like:

- (i) Clients, whose perception of quality is influenced by social and cultural norms and their experience, expectations and concerns,
- (ii) Providers who usually lay more emphasis on technical competence and the infrastructure and logistical support from organizations,
- (iii) Program managers who focus on support systems such as logistics and record keeping,
- (iv) Policy makers and donors who are more concerned with cost, efficiency, and outcomes for health investment at a population level.

The complexity of defining quality of care makes it difficult to identify its components and measure it.

Quality of care is a multidimensional concept. There is a diversity of interpretations of what constitutes quality care and the related ways to measure it. Difficulties in assessing quality of care are mainly due to two reasons- i) it involves assessing services that are relatively difficult to assess owing to characteristics of services viz. perishability, heterogeneity, co-production-role of users in the production of the services ii) there is much information asymmetry between providers and users of care, leading to users perceptions being largely shaped by the ‘how’ aspects (functional quality) while the ‘what’ aspects (technical quality) are critical to outcomes.

Although quality of care has certain subjective aspects and can vary between cultures, certain basic standards are internationally recognized and should not be transgressed.

The early works on quality of medical care are from Donabedian. He defined quality of care as: ‘quality of care is the extent to which actual care is in conformity with present criteria for good care’ (Donabedian, 1965). This definition is unique as it incorporated evaluation into the definition. Donabedian developed a framework for quality of care comprising three major elements- structures, processes and outcomes.

The Institute of Medicine (IOM) in 1990 defined quality as ‘ the degree to which health services for individuals and populations increase the likelihood of desired outcomes and are consistent with current professional knowledge’ (Lohr,1990).The IOM defines six dimensions of quality- effectiveness, safety, efficiency, timeliness, equity and people-centeredness.

In a more inclusive definition of quality Wilson and Goldsmith (1995) describe quality as ‘the sum of its four components: technical quality, resource consumption, patient satisfaction and values’ (Wilson and Goldsmith, 1995).

A more commonly accepted definition is ‘quality means clinical effectiveness, safety, and good experience for the patient’ (Goodle, 2009).

The Bruce-Jain framework developed in 1990 was focused on quality in international family planning. They defined quality as ‘the way in which individuals and clients are treated by the system providing services’ (Bruce, 1990). This framework was the first to focus on reproductive health services and defines six elements relevant to improving quality of care in family planning programs: choice of contraceptive methods, information given to patients, technical competence, interpersonal relationships, continuity and follow-up, and appropriate constellation of services.

Hulton et al. in their framework for assessing quality of institutional delivery care adapt the IOM definition while incorporating the concepts of effective and timely access and of reproductive rights. They define quality of maternal health as ‘the degree to which maternal health services for individuals and populations increase the likelihood of timely and appropriate treatment for the purpose of achieving desired outcomes that are both consistent with current professional knowledge and uphold basic reproductive rights’ (Hulton et al., 2000). They provide ten elements of care for assessment, the criteria and standards for each, and also suggest indicators.

In 2014, the Lancet published the Midwifery Series that introduced a framework for quality maternal and neonatal care (QMNC). The framework calls for a change in the provision of care for mothers and newborns and places their needs at its center. The framework supports a system level shift from fragmented maternal and newborn care focused on identification and treatment of pathology for the minority to skilled care for all. It identifies midwifery as a key driver for QMNC within the context of interdisciplinary and integrated skilled care and teamwork.

More recently, the WHO has published its vision for quality of care for maternal and newborn health in 2015 (Tuncalp et al., 2015). The WHO vision defines quality in line with the IOM definition – ‘quality of care is the extent to which health services provided to individuals and populations improve the desired health outcomes’. Along with this definition the vision document highlights ‘in order to achieve this, health care needs to be safe, effective, timely, efficient, equitable, and people-centered’. The WHO framework identifies domains of quality of care which should be targeted to assess, improve and monitor care within the context of the health system as the foundation. This conceptualization of health system foundation is unique to the WHO framework that focuses on health system as the structure which enables access to quality care and allows for the process of care to occur along two important and inter-linked dimensions of provision and experience of care and leading to individual and facility-level outcomes.

This thesis was planned using the Hulton’s framework for quality of care during institutional delivery; the rationale and conceptual details of the studies are provided in the following chapters.

2 RATIONALE

2.1 RATIONALE

A wide range of research studies are available on maternal health in India. These have mostly focused on availability and accessibility of services, while few focus on mortality and morbidity outcomes. Little research has been conducted on quality of maternity care, especially on processes of care that are critical to outcomes. With the success of the JSY program in bringing large number of women to facilities for childbirth, information on care during births at JSY facilities gained more importance, especially in the context of health system strengthening efforts through the NRHM; however there were no such reports available at the time this research was designed.

The rationale for this thesis is based on following major considerations:

Cash transfer programs globally have shown to be successful at improving utilization of services, however there is no clear evidence of their impact on improving long term outcomes. Research shows that their impact on improving intended outcomes is largely dependent on the context and is conditional to a strong supply side of services. The JSY case is peculiar in that it was launched in a weak health system but with concomitant strategies to strengthen this supply side. Hence it is important to study the quality of care in such a context for the JSY cash transfer program.

The NRHM through its reforms was hoped to infuse a new life into the starved health system in India in terms of increased human resources, capacity expansion, improved infrastructure and supplies, decentralization and bottom up planning approaches. The renewed interest in strengthening the health system and the launch of NRHM and the JSY cash transfer program formed important contextual factors for consideration while undertaking this research.

Also, a paradoxical situation prevailed in India when this thesis was planned. While the success of the JSY program at raising facility births in India was well recognized, there were disappointments from less than expected improvements in maternal mortality reduction. Studies then indicated problems with quality of care as a potential reason for the paradox; however no empirical evaluations of the quality of obstetric care provided in the JSY cash transfer program facilities were available.

Globally there has been an increasing recognition of the need to translate program coverage gains to improved health outcomes (i.e. reduced morbidity and mortality) for women by using the quality of care opportunity (Graham et al., 2013) and the fact that quality of care remains less researched area in resource poor contexts.

Hence this thesis was planned to provide information on quality of care in the Indian JSY program. It is hoped that these studies will inform quality improvement in the context of cash transfer programs to promote facility births in low-middle income settings.

2.2 STUDY AIM AND OBJECTIVES

GENERAL AIM

The overall aim of this thesis was to study the provision of care to women participating in a cash transfer program to promote facility births in a resource poor setting.

The objective was to study the quality of obstetric care provided at facilities implementing the JSY cash transfer program in Madhya Pradesh, India.

SPECIFIC OBJECTIVES:

To assess the competence of nurse midwives at JSY program facilities in providing first line emergency obstetric care in three districts of MP (I)

To assess the quality of obstetric referrals in the JSY program in three districts of MP (II)

To determine the implementation fidelity of partograph use for monitoring labour at JSY program facilities in three districts of MP (III)

To assess the quality of routine intra-partum care at JSY program facilities in three districts of MP (IV)

3 STUDY FRAMEWORK

The conceptual framework for this thesis (Figure 3) is based on the Hulton's framework for assessment of the quality of institutional delivery care (Hulton et al., 2000).

In choosing the study framework, I compared the Hultons framework with the framework by Donabedian (Donabedian, 1988) and choose the Hulton's framework in view of its comparative strengths. Hulton et al overcome the weaknesses they point in Donabedian's framework viz. that the link between structural inputs and processes is inconsistent and not empirically proven and the relative importance of different structural elements is determined by contexts. Another important reason for choosing Hulton's framework was because it has a specific focus on institutional delivery care provision, which is the focus of the JSY and of this thesis.

The framework combines evidence from medicine, health policy and social sciences to provide a model for quality evaluation. It separates quality into two constituent parts: the quality of the provision of care and the quality of care as experienced by users, recognizing that use of services and outcomes result not only from provision of care but also from women's experience of that care. It has 10 elements of care.

This thesis has four sub studies that relate to selected elements of Hulton's framework as shown in Figure 3. This thesis is focused on the provision of care, although recognizing that experience of care is important for quality of care. This choice was made considering feasibility of the study and also influenced by my research interests in understanding processes during health care provision.

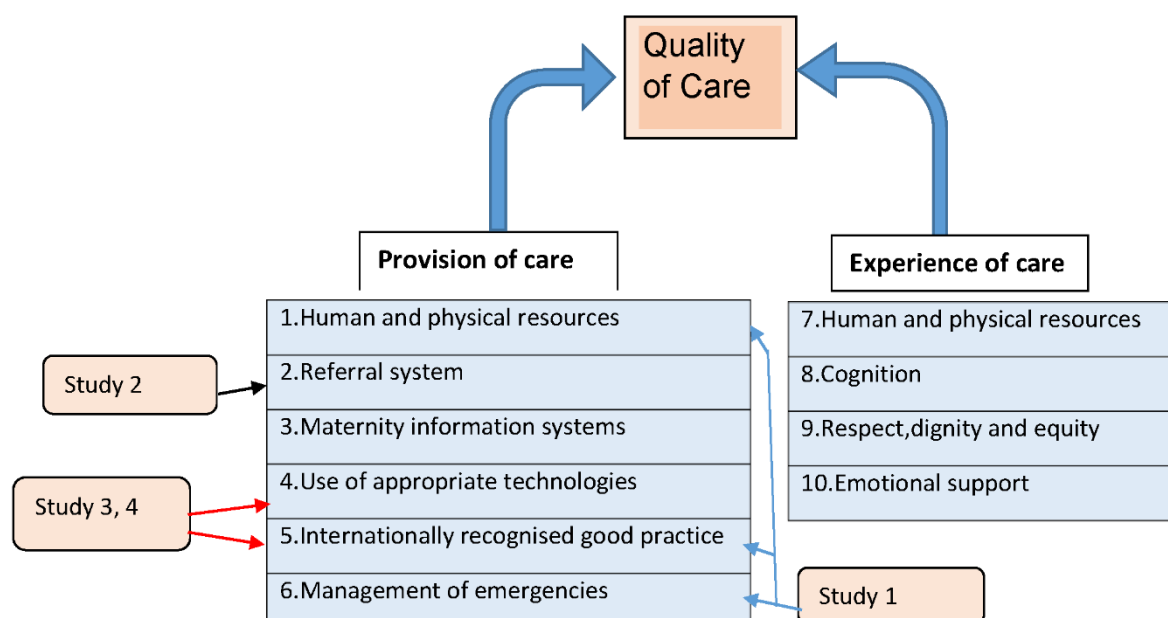


Figure 3: Conceptual framework for this thesis adapted from Hulton et al., 2000

4 METHODS

This thesis uses quantitative and qualitative methods, different designs, data collection and data analysis methods. These are summarized in Table 3.

Table 3: Overview of study design and methods

Paper	Objectives	Design/Area	Methods/ Participants	Analysis
I.	To assess the competence of nurse midwives in the JSY programme at providing first line care for emergency obstetric conditions	Facility based cross sectional study ; 3 districts of MP	1. Vignette based survey using written case vignettes with open ended questions among nurse midwives (n=233)	Descriptive statistics for comparison of competence scores in domains of competence and by facility levels, staff qualification ,experience
II.	To study quality of inter facility referrals in the JSY program	Facility based cross sectional and record review study; 3 districts of MP	1. Cross sectional survey of women who delivered at public and private facilities in 3 districts (n=1182), nested matched case control study with 34 cases of adverse birth outcomes (n=68 pairs) 2. Facility assessment for EmOC status and retrospective record review (two years) of maternal deaths (n=55) at CEmOC facility in one district	Descriptive analysis of reasons for referral , time ,costs, distance, transport Conditional logistic regression for odds of adverse birth outcomes associated with maternal referral Buffer analysis in GIS for spatial analysis of inter facility travel time for mothers who died at CEmOC facility in one district
III.	To assess the implementation fidelity of partograph use in the JSY program	Facility based mixed methods study; 3 districts of MP	1. Obstetric case records review (n= 1466) 2. Vignette survey among nurse midwives (n=233) 3. Interviews with staff (n=11)	Descriptive statistics to present record review results and competence scores Thematic framework approach for analysis of qualitative data
IV.	To assess quality of routine intrapartum care at facilities providing JSY program in MP	Facility based qualitative study; 3 districts of MP	1. Non participant observation of deliveries (n=18) 2. Semi structured interviews with staff (n=10)	Thematic framework analysis

4.1 STUDY SETTING:

This thesis is based on studies conducted in three districts of MP province in India. Madhya Pradesh is a large central Indian province with a population of about 72 million which is 6% of the national population. It has a geographical area of 308,252 square kilometers and is the second largest province in India. MP is one of the less developed provinces in the country with poorer health indicators (Table 4). A large section of the population resides in rural areas (72%).

MP ranks very low on Human Development Index with a value of 0.375 (2011) which is much below the national average. Majority of people in MP earn their livelihood through farming and about 31% populations live below the poverty line (i.e. monthly per capita expenditure below INR 771 in rural and INR 897 in urban area). MP has 51 districts that are administrative units with much variation in their health and socio demographic indicators. The studies in this thesis were conducted in three districts that represent different geographic regions in the province and a range of health and development indicators. I have not described the study setting in greater detail as to ensure confidentiality of respondents in the study.

Table 4: Health and socio demographic indicators for Madhya Pradesh (MP) and India

Indicators	MP	India
Total population(in Millions) 2011*	72	1210
Total number of poor(in millions)^	26.2	354.7
Total Fertility rate(2013)#	2.9	2.3
Female literacy (%) 2011*	60	65.5
Facility births (%) (2013)#	75.5	74.4
Maternal mortality ratio (2010-12)#	230	178
Infant mortality rate (2013)#	54	40

Source: [Government of India, *Census 2011, ^Planning commission, #Sample Registration System 2013]

The health system in MP is three tiered, as in the rest of the country, with primary health centres, community health centres and district hospitals at primary, secondary and tertiary levels. The JSY in MP functions largely through the public health system. All public facilities implement the JSY and all women in MP are eligible to participate in the JSY. The JSY incentive in MP is INR 1400 for rural women and INR 1000 for those urban. MP has shown one of the highest uptakes of the JSY programme in the country. There have been about seven million beneficiaries of the JSY since inception. During the JSY, the proportion of facility births in MP increased from 30% in 2005 to 75.5% in 2013.

The studies in this thesis were nested in a large European Union funded project-MATIND that studies the JSY in MP province. I have been employed on the MATIND project during doctoral studies.

4.2 DATA COLLECTION AND ANALYSIS

Data collection tools and methods

Each setting presents specific issues that may require evaluating certain aspects of quality than others. It is important that the tools used in a given setting respond adequately to the concerns of the stakeholders. Hence readily available evaluation tools might not be always appropriate and adaptation to local needs might be required. However existing evaluation tools being already tested in their original settings, provide a well-established scientific basis for further

development and adaptation. For studies in this thesis we have used instruments we specifically developed for each of these studies.

In this thesis I have used both quantitative (I, II, III) and qualitative (III, IV) data collection methods. The quantitative data collection methods used to collect cross sectional data were written case vignettes (I, III), structured questionnaires (II), and structured formats for case record review (III). The qualitative data collection methods used to explore 'how' 'what' and 'why' aspects of the studied phenomenon (obstetric care practices) were observations (IV) and individual interviews (III, IV). These methods are described below.

Written case vignettes (I, III)

A case vignette is a fictitious presentation of a clinical condition. Case vignettes closely simulate real life situations without compromising patient care or confidentiality and are known to be a useful method to assess clinical competence and quality of care. Studies have shown vignettes are a robust method to assess clinical quality across different patient conditions, sites, complexities, and levels of provider training (Peabody et al., 2000; Peabody et al., 2004; Morita et al., 2002; Epstein et al., 2001; Englund et al., 2000). Vignettes have been shown to be useful to assess intra-partum decision making (Styles et al., 2011), especially on large scale since they allow exploring situations that can otherwise create moral, ethical or safety issues and even assessing how participants would react in risky scenarios (Hughes and Huby, 2001). Importantly, using vignettes it is possible to ensure that all participants are directed to respond to the same stimulus, thus allowing the researchers a degree of consistency and control comparable to that in experimental designs (Alexander and Becker, 1978). We used written case vignettes that allowed us to present cases of obstetric complications to all respondents and score the results objectively. Furthermore, the open ended nature of responses revealed respondents' understanding of the case presented and what they thought was appropriate rather than limiting to identify if they knew the appropriate elements.

Structured questionnaires (II)

Structured written questionnaires commonly use close ended questions allowing the possibility to analyse the data collected using quantitative methods. We used structured questionnaires in a cross sectional facility based survey of post- partum women to determine their delivery details, socio demographic background and details of referral services if used.

Structured formats for case record review (II, III)

Record reviews are a commonly used method to conduct clinical audits. Structured formats for record review resemble structured written questionnaires and are commonly close ended in nature, the difference being instead of a question being asked of a respondent, the reviewer studies the record to obtain the required information to fill in the given format. We used such formats for a facility based review of obstetric case records in study III and for maternal death records in study II.

Observations (IV)

When the aim of the research is to understand a phenomenon, rather than people's accounts of it, observational methods are often cited as 'gold standard' of qualitative methods since they provide direct access to what people do, as well as to what they say they do (Green and Thorogood, 2013a). Observations are believed to gather 'purest' form of data directly from naturally occurring situations, in which behavior and responses to it can be observed in situ. Observational methods allow the researcher to record features of everyday life that could seem mundane and unremarkable to participants in an interview as also features of the context in which these occur. We used non participant observational method to collect naturally occurring data, with less disruption to the working life of the delivery rooms, using a semi structured observation guide that offered great potential for qualitative analysis.

Individual interviews (III, IV)

The interview is the most widely used method of generating data in qualitative health research through conversation directed towards researcher's particular needs for data. Interview is a recommended method to gain insight into personal experiences, to enable discussion around sensitive topics and avoid interpersonal bias (Green and Thorogood, 2013b). In a semi-structured interview the researcher sets the agenda for the conversation in terms of topics to be covered but the interviewees responses determine the kinds of information produced about those topics and also the relative importance of each of them. Semi structured topic guide allows the interview to be more spontaneous owing to freedom to the interviewer to adapt while directing the interview. We used individual interview method to collect data from staff on routines of delivery care in the JSY program facilities.

Quantitative data analysis (I, II, III)

Descriptive statistics were used to analyse the scores for the responses to the case vignettes. (I, III) and results from the record review (III). Conditional logistic regression model was used in the analysis of the matched case control study (II). Conditional logistic regression is the recommended method for analysis when data are individually matched. (Kirkwood and Sterne, 2003)

Qualitative analysis (III, IV)

All qualitative data in this thesis were analysed using the thematic framework approach (Ritchie et al., 2003). Thematic framework approach allows transparent and rigorous analysis and is considered suitable for analysis of qualitative health research data addressing policy related questions. The approach requires the researchers to read the transcripts to get a sense of the data and then develop a coding framework, apply the coding framework to the entire dataset (indexing), chart the data in matrices (charting) and then identify patterns in the data, develop explanations and find associations.

Buffer analysis in GIS (II)

In Geographical Information System (GIS), a buffer is a zone around a map feature created using units of distance. It is mainly used for identifying areas surrounding geographic features. Buffer analysis involves generating buffers around selected geographic features and then

identifying features based on whether they fall inside or outside the boundary of the buffer. We used buffer analysis to identify referring facilities falling within or outside a buffer of 100 Km from a referral hospital. (II)

Study 1

In study 1, we assessed the competence of nurse-midwives in the JSY program facilities at first line care for emergency obstetric complications. We defined competence using the framework proposed by Miller et al. (Miller, 1990) that portrays competence as a stage that follows knowledge acquisition and leads to performance (Figure 4)

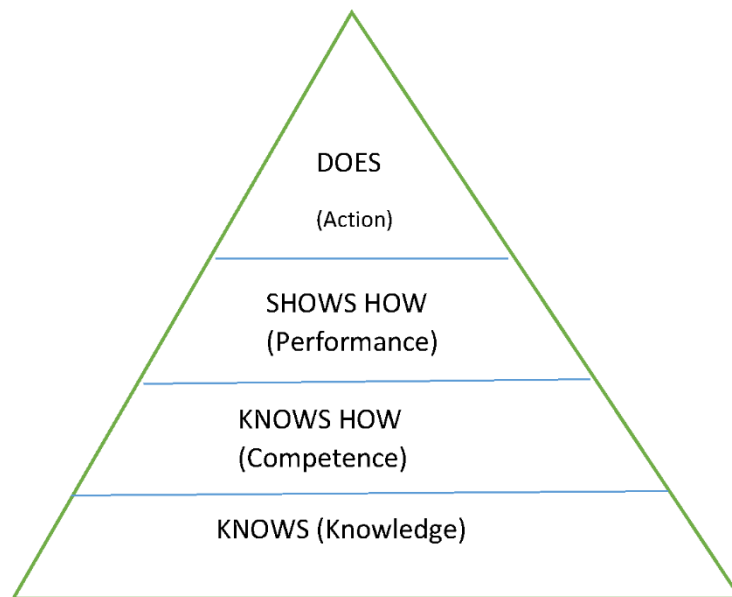


Figure 4: Framework for clinical assessment by Miller et al., 1990.

This was a cross sectional study at public facilities that conducted at least 10 deliveries a month in three selected districts of MP. All nurses who are routinely deployed on duty as frontline delivery-room nurses, or as their supervisors in the selected facilities, were invited to participate in the study by responding to a vignette-based survey.

The vignette development process was guided by the model for construction of vignettes proposed by Heverly et al (Heverly et al., 1984) that includes four main steps in the development of vignettes: identifying study factors, generating vignette components, constructing the vignettes, and validation. We chose to assess competence at first line care for haemorrhage and eclampsia and developed four vignettes, two for each condition. The four vignettes depicted- (i) ante-partum haemorrhage (APH), (ii) post-partum haemorrhage (PPH), (iii) ante-partum eclampsia in a woman with known pregnancy induced hypertension, (iv) ante-partum eclampsia in a woman with no previous ante-natal care. The Indian Government's handbook for training of skilled birth attendants (Ministry of Health and Family Welfare, 2010), which also is in line with international standards for midwifery care (International Federation of Midwives, 2010), was referred to as a technical base for developing the vignettes. Along with the case description for the vignette we also developed unambiguous questions on initial assessment, diagnosis, and first line care. We approached three senior obstetricians with

relevant experience to assess the content validity of the vignettes and senior nurse-midwives to assess the face validity. The standard responses to each of the questions following a vignette were developed in line with standard practices recommended by the handbook for skilled birth attendants. These were finalized in consultation with the same experts who assessed the vignettes for content validity. The relative importance of different tasks for assessment and or management of each complication was considered in developing the scoring scheme. The scoring scheme was also tested by using responses from the pilot study.

The survey was administered to nurse-midwives at the study facilities after adequate explanation of the study purpose and clarification that it was not an individual assessment. Each respondent was asked to write her responses to the questions, so that they reflected the appropriate action to take when attending to such a patient as the vignette described. Each respondent received two vignettes, one for hemorrhage and one for eclampsia. By creating different combinations of two from the four vignettes, we could ensure not all respondents at a facility received the same vignettes. The vignettes were administered in an unfolding and sequential manner beginning with case presentation and the question on initial assessment, then giving information from clinical examination and the questions on clinical diagnosis and first line care. On average, respondents took about twenty minutes to complete the survey.

Two researchers independently scored the responses while also maintaining a record of incorrect responses. Descriptive statistics including medians, ranges, and histograms were used to present the scores. The Kruskal Wallis test was used to assess differences in scores by level of facilities, qualification, and districts while the Mann Whitney test was used for differences in competence by age, experience, SBA training, and average number of deliveries performed. Agreement between competence scores by the two raters was assessed using the reliability coefficient.

The overall competence score was thus arrived at by summing the score on each of the element assessed. Further, to assess levels of competence in domains, we categorized responses into three main domains; namely initial assessment, diagnosis, and first-line care in line with the questions that followed the vignette presentation. To determine participants' competence in a domain, a few items were identified as critical to the domain in consultation with an expert, and a participant was considered competent in the particular domain if each of the items identified were mentioned in her response; those mentioning some or none of the critical items were considered incompetent in that domain.

Study 2

In study II, we assessed the quality of referral services in the JSY program in the three districts of MP. Although referral also includes the community level from where it begins, we limited this study to referrals between facilities in order to keep relevance to the context of the JSY. We used the term referral to mean movement of women seeking intra-natal care from one health facility to another, because of an inability to receive the necessary obstetric care at the first facility attended. We adapted the referral chain model proposed by Jahn and Brouwer (Jahn and Brouwer, 2001) that comprises three main components of the referral chain- sender, transport and receiver as depicted in Figure 5.

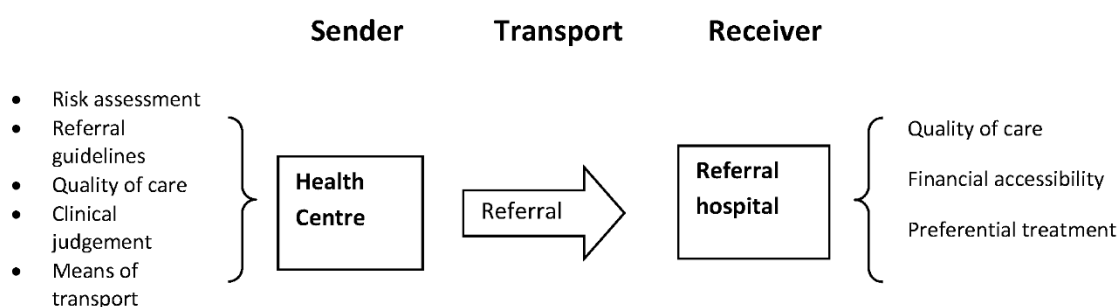


Figure 5: Model of referral chain, adapted from Jahn A and De Brouwer V, 2001.

In the three study districts, we conducted a facility based cross sectional survey including all facilities that conducted at least 10 deliveries a month, both public and private. At each facility trained female research assistants spent five consecutive days interviewing all women who accessed the facility for delivery care to gather data on socio demographic profile, delivery and referral details. When any woman was referred out from the facility during the five survey days, the research assistants met with the concerned nursing staff to obtain details of the referral sent.

In one of the three study districts, that reported one of the highest maternal mortality ratios in the state, in addition to the above mentioned survey we also conducted a maternal death record review. The review was conducted at the only Comprehensive Emergency Obstetric Care (CEmOC) facility – i.e. one providing blood transfusion and caesarean section services in addition to basic obstetric services. The CEmOC facility was identified through a facility survey conducted in the district. From the maternal death records at the facility (Apr 2010-Mar 2012), records for women who were referred into the facility before their death were identified and the data on sending facility locations, delivery details, cause of death, and times of arrival and death were extracted.

We aimed to determine spatial access by measuring travel time between the sending facility and the receiving CEmOC facility basing on the UN standard of two hour travel time as an indicator of spatial access. The distance between the sending and receiving facilities was converted into travel time assuming the average speed of a van in the study area is 50 km/hour based on information provided by key informants including nursing staff and ambulance drivers in the study district. All sending and the receiving facilities were geo-positioned onto a digitised map of the district. Time between arrival and death was derived from the medical record entries.

To describe inter facility referrals we used descriptive statistics and traced referral pathways for women who were referred. We analysed these by facility levels to produce referral patterns.

To examine the association between maternal referral and birth outcomes, we used a nested matched case control design using data from the cross sectional survey. We defined cases as women who delivered at term and had adverse birth outcome defined as intrapartum foetal death or in-facility neonatal death within 48 hours post- partum. Controls were women who delivered at term and had live neonates at 48 hours post- partum matched individually to cases

for the type of obstetric complication and place of delivery. Each case was matched to two controls. Analysis to study association between maternal referral and adverse birth outcome was by calculating odds ratios and using conditional logistic regression to control for potential confounders.

To conduct the spatial analysis of transfer time from sending to the receiving CEmOC facility among in-facility maternal deaths, we plotted the CEmOC facility and all sending facilities from where the deceased mothers were referred to the CEmOC facility on the map. Given that travel time of two hours to a CEmOC facility is considered a standard for adequate spatial access to EmOC (Bailey et al., 2009), we constructed buffers of a radius of 50 km (equated to one hour travel time) and 100 km (equated to two hours travel time) around the CEmOC facility. Deaths among mothers who were referred to the CEmOC facility from a facility located within the 2 hour buffer indicated poor quality referral services, either at the sender or receiver levels or at both these levels in the referral chain. Time spent at the CEmOC facility before death was used to assess care at the receiver level facility.

Study III

In study III, we used a mixed methods design to study the implementation of the partograph in the JSY program facilities.

Implementation fidelity is the extent to which an intervention is implemented as intended. In their framework for implementation fidelity Carroll et al. (Carroll et al., 2007) describe adherence with its categories and several potential moderating factors. For this study we adapted the framework by Carroll et al. (Figure 6) by focusing on coverage subcategory of adherence and two moderators- facilitation strategies and participant responsiveness. We aimed to study implementation of the partograph by specifically determining adherence to partograph use, staff ability to use it, and their responsiveness to the policy of partograph use.

To assess adherence to partograph use we conducted a review of obstetric case records at all public facilities conducting 10 or more deliveries a month in the three study districts. Obstetric records for the recent one year were reviewed. Quota sampling was used to obtain facility quota proportionate to facility delivery load aiming for a sample of 500 records per district. Systematic random sampling was used for sample selection. The selected records were retrieved and reviewed to identify if a partograph was included. Given the inability to assess if a partograph was used appropriately owing to limitations with the records, we were able to document only if any attempt to use the partograph was made. A partograph was considered filled if at least one clinical finding was recorded on the graph to plot cervical dilatation against time.

To assess the ability of staff at using the partograph, we conducted a vignette based survey among nurse-midwives at study facilities. Vignettes with clinical findings about progress of labour were presented to nurse-midwives requesting them to plot the findings on the partograph and answer the subsequent question regarding clinical decision in the particular case. Before the survey, we assessed the content validity of the vignettes and the scoring method by expert opinion and the face validity by discussion with nurse-midwives. The responses were scored by two researchers independently and the inter rater reliability was determined.

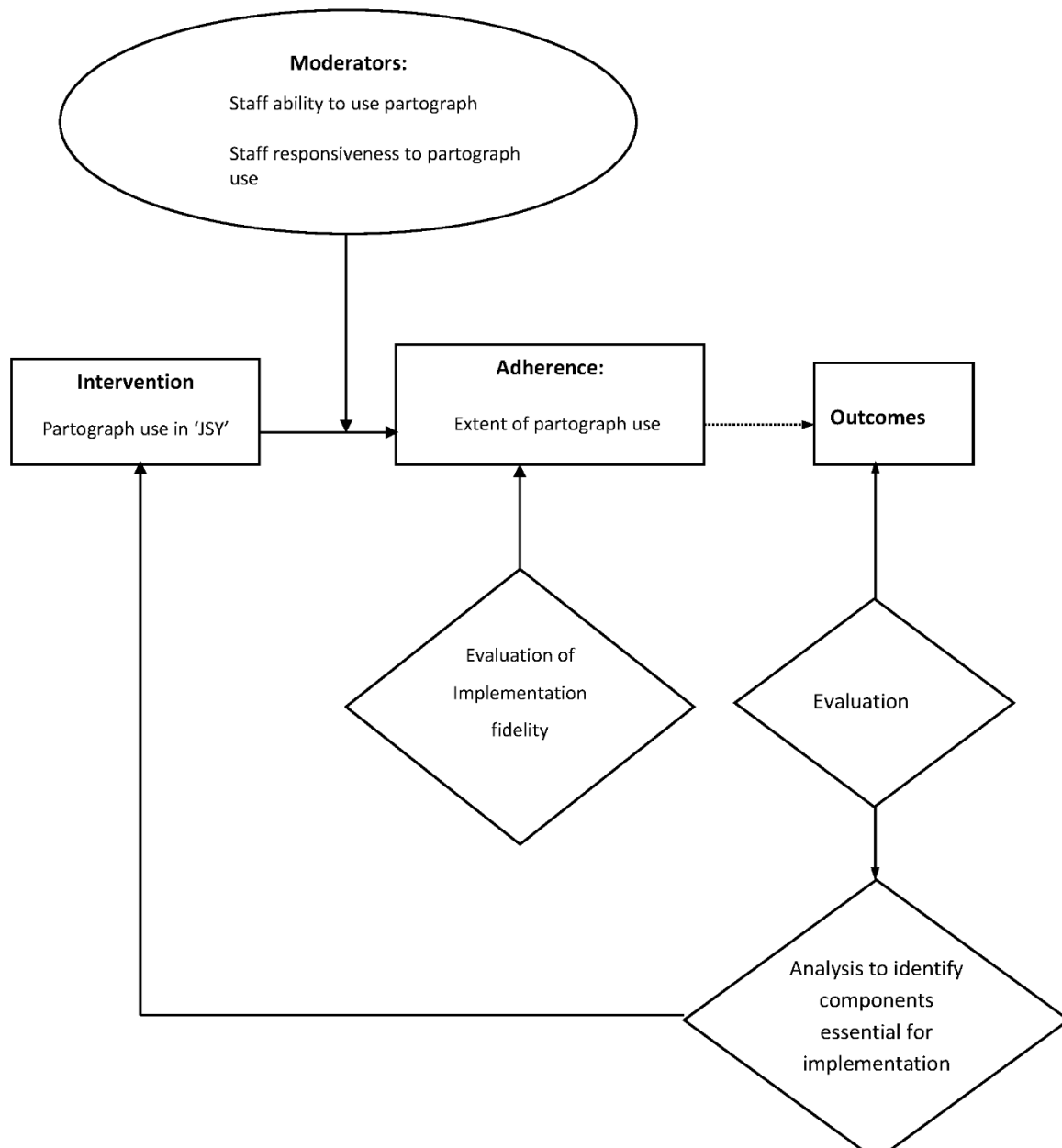


Figure 6: Study framework adapted from conceptual framework for implementation fidelity by Carroll et al., 2007.

To determine the responsiveness of staff to the policy of promoting partograph use, we conducted semi structured interviews with purposively selected staff members prominently involved in providing delivery care. The 11 interview respondents were chosen aiming for maximum variation in sampling, thus we included respondents from different facility levels and considering their experience, qualification and position. The interviews were conducted in the facility at a location chosen by the respondent and in the language preferred by her. The interviews were audio taped with permission.

Data from the record review and the scores from the vignette survey were analysed using descriptive statistics and inter rater reliability was assessed using intra class correlation. Data from the interviews were transcribed verbatim, translated into English and read several times to develop a coding framework. The thematic framework approach was used for data analysis.

Study IV

In study IV, we explored the practices during routine care for vaginal delivery at JSY program facilities in three districts of MP by way of non-participant observation and the potential reasons for the observed practices through interviews with staff.

In the three study districts, observations were conducted at 11 facilities: 3 DHs, 6 CHCs and 2 PHCs. Knowing that observers presence can influence the data collection, we employed strategies to minimize this - the observers visited each facility for five consecutive days as a part of a larger team collecting various data from the facilities, timing of the facility visits was unannounced, observers were introduced to the staff by the facility in-charge and spent time in the delivery room for staff to get accustomed to their presence, observers did not take any notes during the observation. Observations were using a semi structured observation guide that was developed considering nationally (Ministry of Health and Family Welfare, 2010) and internationally (World Health Organization, 1996) recommended practices for routine delivery care and relevant local experience of the authors. Observations were non participant – the observers did not take part in any of the activities, but just observed (except in life threatening situations) and collected data on technical as well as behavioral aspects of care. I was accompanied by a trained nurse during observations in two districts. Immediately after each observation I made notes and expanded these within two days to develop transcripts that the accompanying nurse checked for completeness and accuracy.

Following preliminary analysis of the observation data, we decided to substantiate it with interviews with staff to explore the reasons for the practices we observed. We developed a semi structured interview guide informed by our observations, and interviewed 10 staff members purposively chosen for this. These included 2 obstetricians and 8 nurses working in senior positions at delivery rooms in CHCs or DHs. The interviews were audio taped with permission, transcribed and translated into English.

Data from the observations and the interviews were analysed using the thematic framework approach. All co-authors were involved in the analysis processes. First the observation data were analysed. The observation transcripts were read to identify emerging concepts and thus develop the coding framework. All transcripts were then indexed using the coding framework. Matrices were used to chart the indexed data for each code, allowing for comparison within and across cases. Maps were then developed to help illustrate the patterns in the data. These matrices and maps were used to describe similar and divergent processes and practices and, develop explanations, and find associations between them. A similar approach was followed for the analysis of the interviews informed by the analysis of the observation data.

4.3 ETHICAL CONSIDERATIONS

All staff members and women who participated in the studies included in this thesis were informed of the purpose of the studies before seeking their consent.

We spent adequate time to build good rapport with potential participants and gave them an opportunity to seek answers to any relevant questions. Participation was voluntary, and no incentives to participate were provided. All participants were informed that they had the right to withdraw consent at any time without giving any reasons for the same and withdrawal would not affect their care or job. Confidentiality was ensured to all participants. Consent was obtained in writing from staff for the vignette survey (I, III) and from women in the cross sectional survey (II). Consent was verbally provided by women for the observations (IV) and by staff for the interviews (III, IV).

Ethical approval was obtained for studies in this thesis from the Institutional Review Board at R D Gardi Medical College, Madhya Pradesh, India.

5 FINDINGS

This chapter presents the findings from the four sub-studies in this thesis. A brief summary of the findings is presented first followed by detailed findings from the sub-studies.

Summary findings: This thesis finds the quality of provision of care in the JSY program in MP requires much improvement. The care currently provided in the program facilities is not of an acceptable quality. This is evident from findings of poor competence of staff at providing first-line care for common obstetric complications, poor quality of referral services in the program, low implementation fidelity of partograph use for monitoring labour in the program facilities and routines of care deviating from standards for skilled birth attendance.

5.1 COMPETENCE OF NURSE-MIDWIVES AT PROVIDING FIRST LINE EMERGENCY OBSTETRIC CARE:

The vignette survey achieved a response rate of 91%, 233 nurse-midwives from 73 facilities participated in this study. Most participants were ANMs (66%). The median competence score was 5 (out of 20), it ranged from 0 to 14. For 75% participants, the score was less than 7 i.e. below 35% of the full score. The median score for the vignette on hemorrhage was 3 and that on eclampsia was 2.5, each out of a maximum of 10. In the haemorrhage case, although about two thirds of respondents recognized the need to refer the case, only a fifth mentioned the essential elements of stabilization prior to referral.

Although there were statistically significant differences in the scores between subgroups- those with General Nurse and Midwife (GNM) qualification, working at district level facilities, from the developed district , and those undergone SBA training scored higher than their counterparts, these differences have little clinical implication, as the scores were low overall, rarely exceeding 35% of the maximum score.(Table 5)

Table 5: Differences in competence score by participant characteristics

Characteristic	Category	Median Score (% Max score)	P value
Age	≤ 35 years	5.5 (27.5)	0.71
	>35 years	5 (25)	
Average deliveries conducted	≤ 30/month	4(20)	0.00
	>30/month	6(30)	
Maternity experience	≤5 years	5.5 (27.5)	0.79
	>5 years	5(25)	
SBA Training	No	4(20)	0.00
	Yes	5.5(27.5)	
Qualification	ANM	4(20)	0.00
	B Sc	6(30)	
	GNM	7(35)	
Facility level	Primary	3.5(17.5)	0.00
	Secondary	6 (30)	
	Tertiary	7(35)	
District	District 2 (HDI* 0.4)	4.5 (22.5)	0.00
	District 1 (HDI 0.5)	4.5 (22.5)	
	District 3 (HDI 0.6)	7 (35)	

*HDI-Human Development Index

Analysis of the scores for domains of competence viz. assessment, diagnosis and first line care, showed overall 14% of participants were competent at initial assessment of the studied complications, 58% were able to arrive at a correct clinical diagnosis, and 20% were competent at providing appropriate first-line (Figure 7). In the assessment domain competence was poorest for PPH, while in the domain of first-line care competence was poorest for eclampsia, in contrast to the ability to diagnose it.

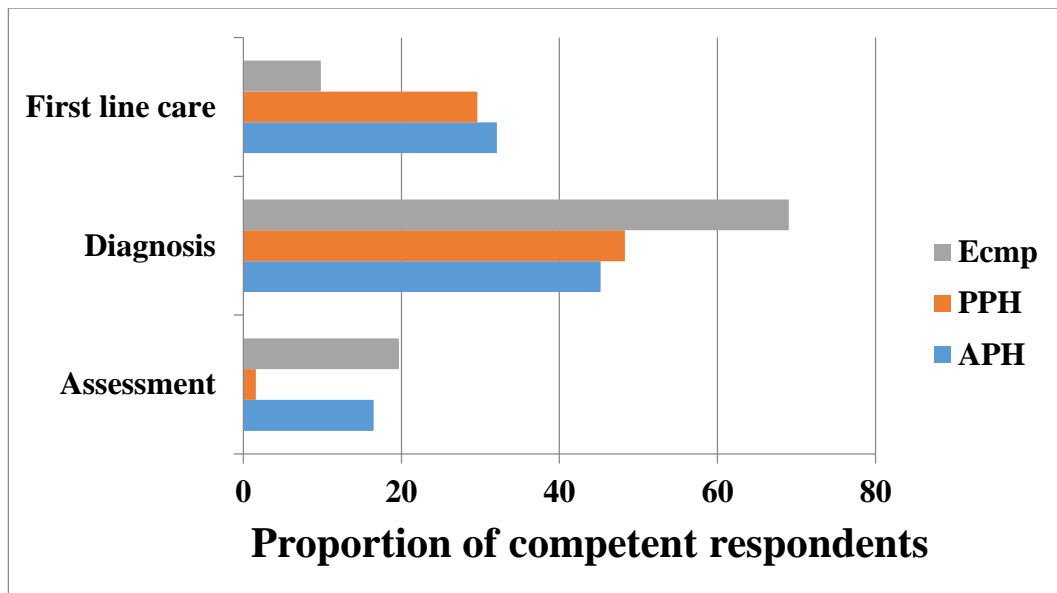


Figure 7: Proportion of competent nurse-midwives domainwise and by complication type

Also not all those participants competent at diagnosis were competent at management of the complication. Of those competent at the diagnosis, 44% were competent at first line care for APH, 39% for PPH, and 13% for eclampsia. The responses were open ended and hence revealed what participants thought was appropriate to mention in the response. These indicated poor understanding of the case, non- perception of the emergency, and unnecessary care. Examples include responses as APH being caused by sexual activity or lifting weight, blurred vision in the eclampsia case assumed to be related to night blindness, advising iron and folic acid in the haemorrhage case, routine ante natal care in the eclampsia case, and antibiotics in both the cases.

The reliability coefficient for inter rater reliability was 0.97 (95% CI: 0.95-0.99) indicating strong agreement between raters.

5.2 QUALITY OF REFERRAL SERVICES

There were 1182 mothers who accessed the 96 study facilities during the five day study period at each. Of this total, 11% (111) were referred in to these facilities, while 69 others were referred out of these facilities.

Prolonged labour was the most common reason (39%) for referral; other reasons included leaking amniotic fluid (13%), haemorrhage (8%), pre/eclampsia (7%) and also facility dysfunctionality (non- availability of staff, or power and water shortages at sending facilities) (7%). Over one third (40%) of referrals from CHCs were for prolonged labour and a fifth were for leaking membranes, both are conditions ideally expected to be managed at secondary level.

Referral patterns mapped by tracing the referral pathways showed CHCs received very few referrals if at all. Referrals were made from CHCs and PHCs and most of these women (70%) accessed care at DHs. However when second order referrals were made further from the DHs, half of such cases accessed care at private hospitals. Bypassing of the referral chain i.e. direct referrals from PHCs to DHs was common. Referrals from public to private facilities were rare. (Figure 8)

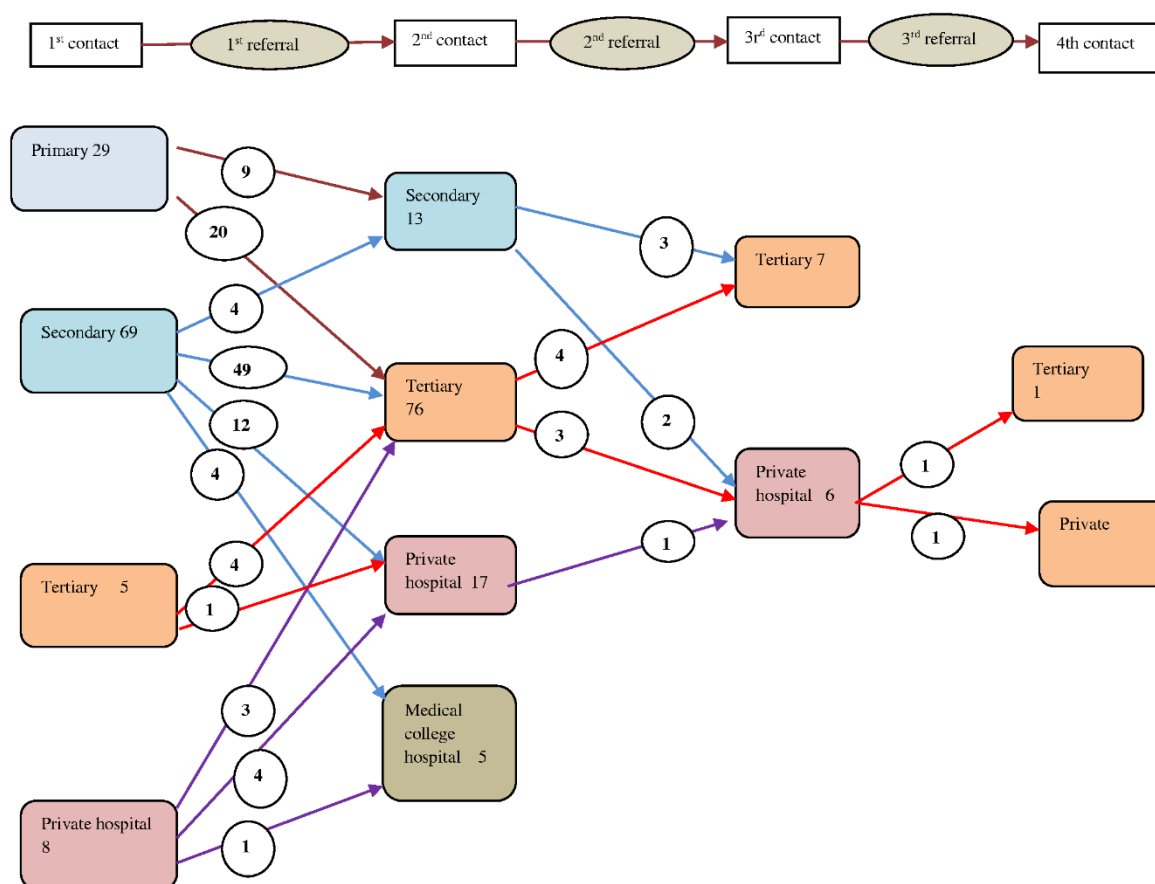


Figure 8: Referrals by facility levels among referred in mothers. (Arrows point to receiving facilities; encircled numbers on arrows indicate numbers of mothers who went to the receiving facility.)

Data on delivery outcomes for the 1113 mothers who were treated at study facilities (excluding the 69 referred out) showed 36 had adverse birth outcomes (intra partum foetal death or early neonatal death) including two among pre term births.

In the matched case control design to study association between maternal referral and adverse birth outcome at term delivery, adjusted odds for adverse outcomes were twice as higher among those referred than those not referred (OR 2.6, 95% CI 1.1-6.6) (Table 6).

Table 6: Adjusted odds of association between maternal referral and adverse birth outcomes.

Variable	Odds ratio (95% CI)	P value
Maternal referral	2.6 (1.08; 6.6)	0.04
Age	1.8 (0.60, 5.51)	0.28
Education	1.2 (0.43- 3.43)	0.70
Below poverty line	2.1 (0.80-5.31)	0.13
Parity	0.6 (0.19-2.02)	0.43
ANC visit	1.2 (0.57, 2.48)	0.63
Provider	0.3 (0.07, 1.25)	0.10

The maternal death record review showed 124 deaths occurred at the CEmOC facility in the two years, while there were 10,474 births during this time. Of the maternal deaths, 55 were in women referred in to the facility. Most of these referrals were sent from CHCs. The buffer analysis of travel time between sending facilities and the CEmOC facility (receiver) revealed that for 54 maternal deaths (98%) the sending facilities were located within a two hour buffer from CEmOC facility indicating good geographic access (Figure 9). The median time between arrival of mothers at the CEmOC facility and death was 6.75 hours (IQR-2.1–32 hours).

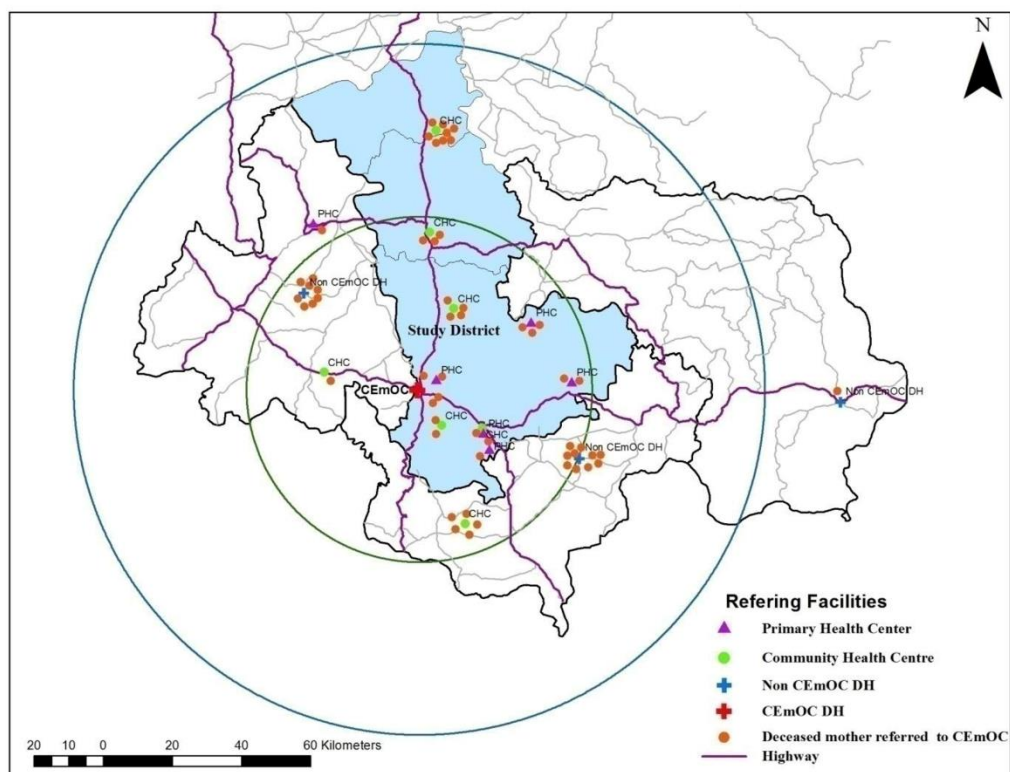


Figure 9: Buffer analysis of distance between CEmOC facility and facilities that referred the 55 mothers who died at CEmOC facility. (Circles in the figure are buffers with radius of 50 Km and 100 Km around the CEmOC facility)

5.3 IMPLEMENTATION OF THE PARTOGRAPH TO MONITOR LABOUR

We reviewed 1466 records at 73 public facilities and surveyed 233 nurse-midwives. Survey participants were mostly ANMs (66%), while few were GNMs (28%) or with BSc (6%). Two-thirds of ANMs in our study were at primary care facilities, though some were also posted at higher level facilities. GNMs and BSc nurses were mostly at secondary and tertiary care facilities.

Of the 1466 records reviewed, only 6% had a filled partograph i.e. with at least one assessment of cervical dilatation plotted against time. Most case records where a partograph was used were found at DHs, while none were found at the PHCs.

Scores for responses to the vignette survey showed poor competence at using the partograph. The mean score for competence in plotting a partograph was 1.08, ranging between 0 and 9 (of

10). Of all participants, 75% scored below 15% of the full score and only 3.4% scored above 50% of it. However despite an inability to plot findings on the partograph, 27.5% participants were able to arrive at a correct clinical decision regarding first line care for the condition presented.

The analysis of the data from interviews resulted in three themes: use partographs rarely and retrospectively, training does not support correct use of the partographs, and partographs can be useful but are not feasible. The themes and their composition is presented in Figure 10.

Use partograph rarely and retrospectively	Training does not support correct use of partograph	Partograph can be useful but is not feasible
<ul style="list-style-type: none"> • No monitoring hence no concurrent plotting • Plot it retrospectively • Staff shortage and increased workload preclude plotting a partograph 	<ul style="list-style-type: none"> • Underconfidence/inexperience at using partograph • Standard use not demonstrated during pre-service and in-service education, rather include retrospective use 	<ul style="list-style-type: none"> • Useful as an aid for communication amongst staff • More useful at facility level other than their own • Reservations about feasibility at routine use - women arriving too close to delivery

Figure 10: Themes and their composition-findings from staff interviews about partograph use

Staff reported that high workload especially since the JSY and time constraints precluded frequent and timely monitoring, and led to partographs being often filled incompletely. The following quotes elaborate this:

I am mostly alone on duty and many women come for delivery nowadays, so how can I fill the partograph at that time. I fill it up later. (Head nurse)

How could you think it is feasible in our kind of facilities with so much delivery load? (Obstetrician)

Bureaucratic use of the partograph was reported by a head nurse. Although aware that retrospective filling of the partograph was inappropriate, the nurse indicated they were in a way compelled to do so since the use of partographs was monitored by authorities, and inspectors briefly looked through records to see if the partographs were filled.

Respondents at busy facilities like DHs shared that they conducted multiple deliveries consecutively and forgot the findings of a particular case before they could be recorded on the partograph. One of the ways of organizing work at such busy delivery rooms was that some nurses continuously attended to the patients while others wrote the records with hardly any communication about clinical findings.

We are two sisters (nurses) here, so one fills the partograph and the various records and the other one conducts the deliveries. (Head nurse)

Few respondents reported irregular supply of printed partographs as a reason for not using the partograph routinely.

The responses revealed that poor competence at using the partograph was due to poor training. Respondents reported feeling in confident at using a partograph, even after their in service skilled birth attendant training. Staff recollected that during pre- service training also they generally filled partographs post-facto after observing the delivery rather than during labour at the bedside.

We had a casebook with the graph, there were so many of us (students) so we could not do anything there (in the delivery room); we just watched; we used to fill it up later, after going to the hostel. (Head nurse)

I feel afraid that I might fill it incorrectly (and then someone could point it out), so I never fill it. (Auxiliary nurse)

Similar issues with training were reported about the in service SBA training. The nurses recollected that as in-service trainees, they examined women and reported the findings to senior nurses, who then filled the partograph.

The staff felt the partograph was a useful tool theoretically, however doubted its practical utility. It was seen as an aid to communication about progress of labour among staff in the facility and also between facilities in case of referral. Usefulness of the partograph during referral was pointed to other facilities than that of the respondents as noted from these quotes:

People at CHCs, PHCs and small hospitals should fill it because they have to refer women, but we have a doctor available 24 hours here (at DH), we can call her and immediately show her the patient directly (so for us it is not needed as much as for them). (Head nurse)

It is good for high risk cases and those we have to refer from here (CHC). It is useful for the staff at DH (where the woman is referred). (Head nurse)

The commonly mentioned use of the partograph was that it ensures important parameters such as blood pressure and fetal heart rate are examined in a timely manner. Although staff explained the utility of the partograph as an aid in monitoring progress of labour, they felt this was only possible under ideal conditions. They had reservations as to the feasibility of its routine use, particularly because women generally arrive close to delivery, leaving no opportunity for the use of a partograph while staff shortages prevail.

If we have 10 women coming, 5 will come in full dilatation, so we can't fill the partograph. (Head nurse)

Overall, this study found low implementation fidelity of partograph use in the JSY program and identified potential moderators that could influence its implementation viz. provider training, supervision, practice environment, including user compliance (Figure 11).

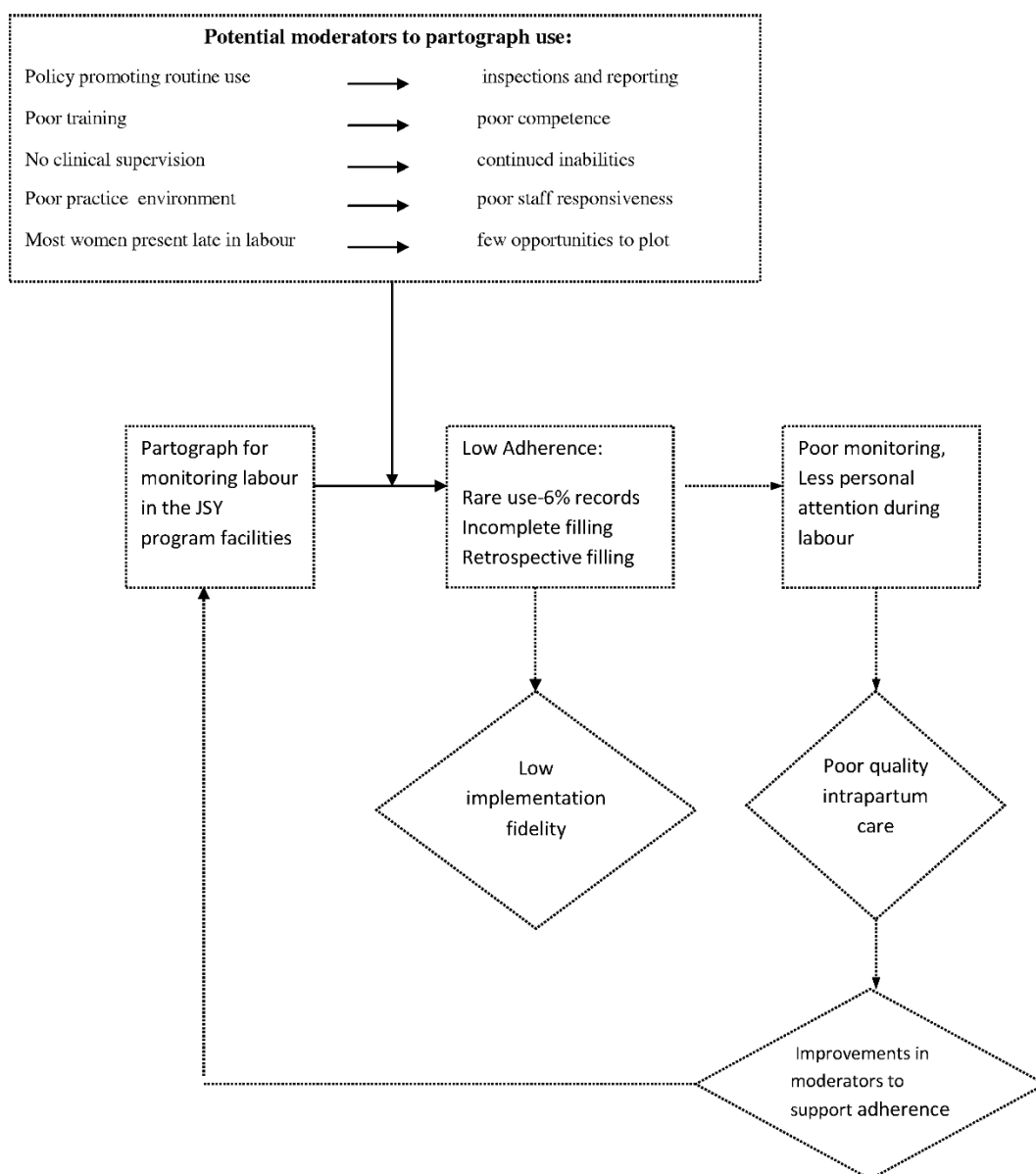


Figure 11: Implementation fidelity of partograph use in the Janani Suraksha Yojana (JSY) programme in Madhya Pradesh (MP), India—an application of Carroll’s implementation fidelity framework.

*Dotted lines represent possible indications from study results and suggestions on potential way forward

5.4 QUALITY OF ROUTINE DELIVERY CARE IN JSY FACILITIES

Our observations of delivery care at JSY facilities ranged from two to eight hours, depending on how soon after arrival the woman delivered. On arrival, women were examined in the delivery room and depending on their progress in labour, were asked to wait in the corridor or on the ward, or stayed on the delivery table. After delivery of the placenta, women were sent to the ward. Most women observed in this study arrived close to delivery.

Three themes emerged from the analysis of the observation and interview data. The first theme ‘delivery environment is chaotic’ encompasses the organisational aspects of care. The second theme ‘staff do not provide skilled care’ describes the technical aspects of the care that was observed while the third theme ‘dominant providers, passive recipients’ describes the behavioral aspects (Table 7). We found little variation in practices across the levels of facilities.

Table 7: Thematic description of intrapartum care in JSY program facilities in MP, India

Theme	1. Delivery environment is chaotic	2. Staff do not provide skilled care	3. Dominant staff, passive recipient
Subthemes	i) Delivery rooms are not conducive to safe women friendly care ii) Poor coordination between providers	i) Limited monitoring before and immediately after delivery ii) Some good practices followed iii) Harmful and unnecessary practices coupled with poor techniques iv) Lack of readiness to provide routine care	i) Staff provide some support during labour ii) Staff abuse and ignore women during delivery iii) Women are passive and accept dominance / disrespect iv) Attendants as ‘go-between’ patients and providers

1. Delivery environment is chaotic: The observations found that the delivery rooms were generally poorly maintained with regard to readiness to provide good quality delivery care. This was observed in several areas: staffing, infrastructure, equipment and supplies, and cleanliness. At most CHCs, a single nurse was responsible for the delivery room as well as postnatal mothers in the ward. At DHs, although there were more staff available on duty, only one or two nurses actually conducted the deliveries while others were seen to be occupied with paper work. The general impression of a delivery room was an unclean area with blood spills, cries and chaos rather than a comfortable, calm and clean place for delivery as is evident from the following notes:

There were about 8 women, 7 nurses and one resident doctor in the delivery room. It was chaotic. Curtains between tables were rolled up. People moving in and out of the delivery room, talking loudly, some women crying in pain...-(DH)

During interviews staff also mentioned issues with management of infrastructure such as power shortages and unavailability of power back up in delivery rooms. In all facilities, equipment was generally not well kept and ready to use indicating poor systems of routine maintenance. Staff reported inability to sterilise instruments in the ideal way and that it was a routine practice to reuse instruments after washing with tap water or dipping in chlorhexidine solution. In some facilities, the instruments were sterilized once a day. Similarly surgical gloves and also single

use gloves were said to be reused without proper disinfection. Staff reported problems with routine maintenance and cleaning of the delivery room such as unavailability of bleach powder to make hypochlorite solution, especially since the JSY.

The staff identified several underlying causes for these problems with quality of care. Irregular and inadequate drug supplies forced staff to prescribe drugs and supplies which attendants bought from private pharmacies. Functional basic instruments dedicated for the delivery room were not available. Many issues with staffing were reported. There is an overall shortage of staff, which has been exacerbated by the increase in numbers of deliveries in facilities, created by the JSY.

Several issues with communication and coordination between providers were observed in the facilities. Findings of clinical examinations were sometimes briefly mentioned at staff handover but a formal and comprehensive communication expected at hand over was never seen. At DHs the staff did not seem to have an opportunity for this in the midst of series of deliveries but even when there were opportunities, they were not utilized. Moreover, this exchange of information was dependent on oral communication, as clinical records were never written concurrently. It was often the attendants who informed the next staff about the previous examinations conducted.

The long hours spent at the delivery rooms during this study did not give a sense of good teamwork. Strong hierarchical relationships were apparent, with little evidence of professional support and collaboration. During interviews, nurses reported that they needed support from peers, but this was rarely provided.

2. Staff do not provide skilled care

It was common to see a vaginal examination done at least one or more times for monitoring the progress of the labour. However, these examinations only measured cervical dilatation and neither effacement nor station was judged. Other essential examinations such as blood pressure, pulse rate, temperature, and pallor were rarely performed. The foetal heart was auscultated only in two cases that a doctor examined. The frequency and duration of contractions were not assessed during any of the observations even when mothers were present in the facility several hours before delivery occurred. The findings of the examinations were not documented in the case notes or the partograph, at the time of examination or later during labour or after delivery.

The ASHA or attendants appeared to decide when to take the labouring women to the delivery room based on their judgments of increased severity of contractions. Owing to an absence of professional monitoring of progress of labour, deliveries often occurred unanticipated leading to chaotic situations around the time of delivery. A similar situation of limited monitoring of women's condition was also seen after delivery.

During interviews with nurses, we enquired about monitoring the progress of labour. Most respondents reported that they assessed progress by conducting vaginal examinations and assessing cervical dilatation. Assessment of foetal heart sounds (FHS) was a rare response and was perceived as something to be done only when there was a delay in delivery. Similarly blood pressure was reported as an examination to be conducted if the patient complained of

headache or giddiness. Staff also reported being unable to monitor all women because of shortage of staff.

Some good practices were observed. These included staff encouraging women to mobilize and take food and tea during labour, staff allowing attendants to massage women's backs and women squatting before delivery. Some staff actively encouraged women to mobilize and eat while some showed passive support by not stopping them when attendants asked women to squat. While monitoring was limited, the staff also performed actions that are known to be potentially harmful and /or unnecessary (Table 8).

Interviews with staff regarding the potentially harmful practices that were observed revealed a lack of appropriate knowledge and poor supervision. For instance, staff nurses felt fundal pressure was a useful way to deliver a baby stationed at the vulva and was helpful when they have no other support. They perceived it could potentially be harmful like causing a perineal tear but also believed it expedites delivery and can thus potentially avoid stillbirth. Staff nurses reported that doctors did not discourage the use of fundal pressure, but often used this technique. The technique of stretching the perineum during second stage was believed to facilitate an easy delivery. Staff nurses appeared to be aware of the potential harms of frequent PV examinations, but explained that attendants often demanded these examinations. They also reported that administration of antibiotics for all women was a good practice, as this prevented infections from multiple PV examinations.

The observations showed essential preparations to conduct a delivery were often missing. For instance, in most study facilities, the instruments tray was not ready. Rather the staff, in most cases the sweeper or the ayah (both are unqualified staff appointed for support work in the delivery room) brought instruments when the delivery was imminent. Instruments used to conduct a delivery were not seen being sterilized or sent for sterilizing in order to be ready for reuse. Instead, the instruments were left at the wash basin, and washed with tap water between deliveries. In the few facilities, where an instrument tray was prepared, only one set of instruments was prepared, even though the staff often received more than one woman in labour at the same time.

Table 8: Description of some harmful and unnecessary practices observed

Observation	Description
Fundal pressure	Routine at all facility levels, often given by ayah or sweeper, in presence of nurses Much force used: standing on stool, by two people at a time
Perineum stretching rather than support	Perineal support was rarely provided Staff generally stretched the perineum, pulled the foetal head out
Frequent vaginal examinations	When multiple providers were present, each conducted vaginal examinations despite seeing one done few minutes ago
Wrong interpretation of vaginal examination findings	Staff misdiagnosed the presenting part on vaginal examination
Improper management of third stage of labour	Uterotonic was not always administered/ administered late- after delivery of placenta Uterus was not stabilized when drawing placenta Placenta was never examined for completeness Manual exploration of uterus was routine
Episiotomy- Timing and technique	When performed (though not routinely), episiotomy was often performed too late Poor surgical technique- too small incisions, in small bits Local anaesthesia rarely given at the time of incision <i>Observation: The senior nurse came to the delivery room asking all staff “what’s the chaos here?” She looked at the participant’s vulva to see the visible caput and said to the junior nurse “what’s this, what were you doing, why didn’t you call me?” as she quickly put on sterile gloves. The head was at the perineum for some time and was delivered with episiotomy by the senior nurse. The newborn was bluish in colour and there was no cry at birth. (DH)</i>
Suturing	No local anaesthesia used during suturing No aseptic technique Unsterile suturing material used, often nonabsorbable material used for skin suturing <i>Observation: The nurse started suturing with a small piece of catgut that was used up before she could suture the innermost layer. The sweeper gave her another small piece left over from an open packet (and unsterile), which the nurse refused and asked for a fresh one. The sweeper opened a packet of catgut and handed it to the nurse with naked hands. Whilst she was suturing, the nurse accepted a phone call, adjusted her saree, and touched her spectacles with gloved hands. (CHC)</i>

3. Dominant staff, passive recipients of care

Though at bigger facilities there were many labouring women and relatively few staff, they were occasionally seen providing support to the labouring women. However, in most observations, women were verbally and physically abused, or ignored. This included slapping women and using foul language. The staff appeared to be anxious at the time of delivery and slapping the woman and forcing her to bear down faster was an attempt by the staff to accelerate the delivery. Generally it was the sweepers or the ayahs who slapped women, while the nurses watched this happen without objection. The presence of attendants and the ASHA did not prevent such behaviour during delivery.

The sweeper hit participant on her thighs asking her not to move. (CHC)

The ayah hit the participant on her hand and blamed her for taking out the IV needle (IV needle in the arm got dislodged while she was bearing down) - (DH)

Staff were reluctant to quickly respond to women/attendants when they sought attention. At times staff were observed to ignore their complaints of pain and even of danger signs. Staff often spoke disapprovingly of rural women and those with higher parity and seemed prejudiced against them. In addition, it was observed that when staff performed any examination or procedure, women were not informed of the findings.

In addition to physical abuse, it was also observed that staff used coercion and dominated the situation. Physical force was used in the second stage of labour so that women adopted the desired position. Staff threatened that if women did not comply, they would be asked to leave, or be left alone in the delivery room.

Neither participants nor their attendants resisted the abuse by the staff; they were tolerant and appeared helpless. At times when attendants noticed rude behaviour from the staff, they rather pleaded with them to take good care of the participant and forced the participant to cooperate with the staff.

We found that attendants had an essential role to play before and during delivery. Extending beyond merely providing companionship during delivery, they kept an eye on the labouring woman and sought medical attention when it was time for delivery, bought drugs and items like gloves around the time of delivery, supplied cloth pieces during delivery.

6 DISCUSSION

This thesis finds that quality of care during facility births in the JSY cash transfer program in the three districts of MP is compromised. The quality of care is poor for crucial aspects as competence of staff at providing emergency care (I, II) as well as routine care (III, IV). These studies indicate that the manifestations of poor quality seem to have deeper systemic causes (III-IV) and provide considerations for quality of care in the context of cash transfer programs to promote the demand for health care services.

In this section, we synthesize the discussion of the main findings from the substudies in this thesis. We present this discussion under five sub-headings below and conclude with a reflection on improving quality of care and the methodological considerations. We begin with discussing findings on appropriateness of care that emerged from all of the four sub-studies, and follow this with a discussion on the potential causes for these findings by discussing their relation to training of nurse-midwives. In the third sub heading we discuss the findings on softer aspects of care – the interpersonal care that mostly emerged from the observations in paper IV. We then move on to discussing the systemic issues that are at the root of many of the problems in providing quality care discussed in the preceding sections; we discuss this in relation to the enabling environment for skilled birth attendance and potential measures for improvement. Finally we discuss our findings in relation to the context of cash transfer programs and derive lessons for future.

6.1 APPROPRIATENESS OF EMERGENCY AND ROUTINE CARE

Our findings from the four sub studies in this thesis indicate the care in the JSY program remains far from appropriate. The poor competence at initial life-saving care for management of common obstetric complications in the setting (I) is indicative of low possibility of early detection of complications and timely care to women even on accessing care in the JSY program. Moreover the lack of proper stabilization before referral in such emergencies (I, II) can result in loss of life saving opportunities, as also reported from other studies in India (George, 2007; UNICEF, 2008). Our studies show the nurse midwives probably fail to recognize the complication (II) or the urgency in the situation and are likely to waste critical time in life threatening situations providing unnecessary measures like antibiotics in the eclampsia case or offering advice on ante natal care and even undertaking potentially harmful actions (I). The results in paper II indicate problems in timely and appropriate care at referral level facilities resulting in ‘third delay’ (Thhadeus and Maine, 1994), especially for conditions like haemorrhage where non- intervention can result in death in as less as 2 hours (AbouZahr, 1998). Notably, ‘third delay’ is an important consideration in locations with continued high mortality rates despite improved access to facility births (Knight et al., 2013). While the purpose of referrals is to increase likelihood of better birth outcomes, our findings from the case control study, although small sized, indicate that use of referral services did not ensure access to appropriate life- saving care (II). Our results are in line with recent studies reporting inefficiencies in intrapartum care resulting in high proportion of potentially preventable stillbirths in India (McClure EM et al., 2011). Although there have been no other reports from studies of competence at EmOC nor of referral services in MP, a maternal death investigation in MP also reported lack of competent EmOC and problems with referral potentially resulted in preventable maternal deaths.(Sri B et al., 2012). Primary care providers in rural MP were

found to have poor competence for general practice (Das et al., 2012); similar to findings of a study in Chattisgarh state that found doctors in public sector to have poor competence (Rao et al., 2013). Several studies from other high maternal mortality contexts like Afghanistan (Kim et al., 2012), Nigeria (Ijadunaola et al., 2010) and Pakistan (Ariff et al., 2010) have reported gaps in knowledge and skills of providers as also reported by Harvey et al. (Harvey et al., 2007) from assessments in Benin, Ecuador, Jamaica, and Rwanda. Similar to our conclusions from paper II, studies from the African region (Moodley, 2000) and from Ghana (Ansong-Tornui et al., 2007) also report a large part of avoidable maternal deaths were due to problems in managing emergencies at hospitals. A meta-analysis of avoidable factors in maternal and perinatal deaths in low resource settings finds substandard health worker practices accounted for the topmost avoidable factor (Merali et al., 2014). Our findings from paper I and II taken together resonate those from a study in Mali that reports maternal-newborn survival in the referral system is influenced by combined effects of point of care, the skill configuration of CHC personnel and distance travelled (Dogba et al., 2011).

The findings from paper III and IV reveal unacceptable routines of care like lack of monitoring during labour, harmful and unnecessary practices, unpreparedness at facilities to provide routine delivery care. The prevailing staff shortages coupled with high workload, especially at district hospitals, precluded adequate time for appropriate monitoring and use of partograph for monitoring labour. Although arrival of women close to delivery was common and this could make monitoring unfeasible, the findings in paper IV provide a deeper understanding that staff were not accustomed to performing routine monitoring tasks like blood pressure, pulse or foetal heart rate even when women arrived earlier in labour; examinations around delivery were limited to assessing cervical dilatation. Our findings indicate dual problems with monitoring – women arrive very close to delivery and that they receive poor attention in facilities until the second stage of labour (III, IV).

Technically poor quality delivery care has been reported by few studies on quality of care in other Indian provinces (Nagpal et al., 2015; Iyengar et al., 2014) and from other high maternal mortality contexts (Therese et al., 2007; Duysburgh et al., 2013; Khalil et al., 2005). Encouraging results on maternal mortality reduction have been shown in low and middle income countries such as Thailand, Malaysia and Sri Lanka where effective coverage was prioritized rather than merely increasing coverage (Pathmanathan and Liljestrand, 2003). Effective coverage of delivery care requires appropriate monitoring of labour and delivery to enable early recognition and appropriate treatment of obstetric complications. Our findings indicate possible underlying factors contributing to inappropriate care such as inadequacies with pre-service and in-service training and the lack of supportive supervision (I, II, III, IV), besides other organizational issues discussed below.

6.2 DOES TRAINING OF STAFF GENERATE COMPETENCE AT PROVIDING APPROPRIATE CARE?

With the launch of the JSY, the Indian Government implemented a 3 week in-service skills building training program for nurses-the skilled birth attendant training. However our findings of poor competence (I, III) and substandard practices despite the training (I -IV) indicate the need to revisit the content of training imparted as well as the methodology. The findings showing staff lack a clinical understanding of conditions like haemorrhage or eclampsia and

identify themselves more with ante natal care and population stabilization programs rather than skilled birth attendants providing life-saving EmOC (I) are concerning, as also improper/no stabilization before referral (I, II), since these cadre are the key and sometimes the only staff women have access to during facility births. These findings suggest a deficit in the quality of training during pre-service and in service training of nurse-midwives in the study settings. Difficulties with understanding the application of the partograph in practice have been reported from other low-income settings as well and demand innovative ways of improving training in partograph use (Lavender et al., 2013).

Pre-service education is provided in public as well as private nursing schools in MP alike in other provinces in the country. Although the norms for nursing education are well defined and the handbook for in-service skilled birth attendant training is also well designed, our findings (III, IV) question if these generate the required competence for appropriate delivery care. Recent studies in India have identified issues with professionalization of nurse-midwives and subsequent decline in their midwifery skills (Mavalankar et al., 2010; Sharma et al., 2013). These studies recommend pedagogic approaches that provide more opportunities for hands on practice, feedback and improved supervision to trainees that are associated with improved competence of trainees (Sharma, 2014). An evaluation of a project to strengthen midwifery in India also highlights the need to match good quality training with attention to health systems changes that will be required to implement the training (Rehnstrom et al., 2010).

The latest national training strategy for in-service training, developed under the NRHM, mentions of a paradigm shift in training- from vertical approaches to integrated approaches, from knowledge transfer to skill building, linking training to functional facilities and regular induction training and biannual in-service training for all staff (Ministry of Health and Family welfare, 2008), however its ultimate effects on practices remain to be seen. Training opportunities for staff are considered indicators of human resource quality (Hulton et al., 2000) and the initiation of the skilled birth attendant training is therefore an useful step, however it is important to understand and correct the failure to produce competence. Ensuring competence of trainers who provide the SBA training, at both the technical content and at imparting the training is an important consideration. Equally important measures are that following the training staff have opportunities to practice the skills and there is supportive supervision. It is important to note that studies have shown that in service training on its own may not improve quality of care (Islam et al., 2006) and that together with adequate support and supervision it can improve quality of care (Koblinsky et al., 2006) and also increase productivity in terms of output from scarce human resources (Frimpong et al., 2011).

Recognising the need to have staff competent at providing quality midwifery services, the Government of India has recently released operational guidelines (Ministry of Health and Family Welfare, 2013) for strengthening pre-service midwifery education; this is essentially a positive beginning. Another important development has been the release of guidelines for supportive supervision by the National Health Systems Resource Centre. (Ministry of Health and Family Welfare, 2013).

6.3 RESPECT AND DIGNITY OF WOMEN ACCESSING CARE

The findings of disrespect towards women reveal poor attitudes of staff (IV) and indicate normalization of disrespect and abuse during facility births. Disrespect and abuse of women during delivery has been reported by several studies from other regions like Kenya (Abuya et al., 2015), Tanzania (McMohan et al., 2010; Kujawaskiet al., 2015) and Nigeria (Okaforet al., 2015). Our findings of late arrival of women in labour could be a manifestation of womens' response to expected abusive behaviour as also argued by Hulton et al. (Hulton et al., 2000). On similar lines, McMohan et al. (McMohan et al., 2014) in their study from Tanzania argue that in response to abusive behavior women might resort to minimising contact with health facilities by delivering at home, departing late for facilities or leaving very early after delivery.

Apart from it's normalization we find several factors that are portrayed as potential contributors to disrespect and abuse in their framework by Bowser et al. (Bowser and Hill, 2010). These include user level factors as poverty, gender; prejudice against rural and poor women of high parity, low staff morale and staff shortages at the provider level, and facility environments lacking standards for non-abusive care and the supervision to maintain such standards.

In our study all staff who provided disrespectful and abusive care were women (IV). Many of these women are likely to experience low status and less respect, in a patriarchal society where gender based violence is prevalent- in a nationwide survey 37.2% married women reported experiencing violence (45.8% in MP) (Macro-International, I.I.P.S, 2007). This is an important consideration, as shown by Mumtaz et al. investigating why the SBA strategy in Pakistan was not as successful as anticipated. They reported an incongruity between the role of the midwife and the dominant social class and gender norms that devalue such a role (Mumtaz et al., 2014). The recent efforts by the WHO to influence governments to address the issue of disrespect and abuse during facility births and suggest measures for respectful delivery care indicate the rising concern for this issue globally (World Health Organization., 2014c). In light of the growing evidence of disrespect and abuse in facility births, the FIGO with its global partners has responded with the 'Mother and Baby Friendly Birthing Facilities' initiative (Miller and Lalonde, 2015). The coining of the term 'obstetric violence' meaning disrespectful and inhuman treatment of women during childbirth and the resolution of the international agencies across the globe to mark obstetric violence as the theme of the May 28th, 2015 international day for women's health are other examples of the growing concern about this issue globally. Another similar global initiative to raise awareness of the need to provide respectful care to women is the announcing of April 11 as the International Day for Maternal Health and Rights. A Comment in *The Lancet's* 2014 Midwifery Series notes that discrimination and abuse is linked to, and reinforced by, systemic conditions, such as degrading, disrespectful working conditions and multiple demands. The authors further argue that disrespect and abuse can be viewed as a signal of a 'health system in crisis'. (Freedman and Kruk, 2014). It is convincing what Horton R wrote in an editorial - achieving respectful care for women in reality 'will need deep soul searching and discussion about the underlying causes of abuse, including health system pressures and the culture of maternity care' (Lancet, 2015).

6.4 FACILITY ENVIRONMENT IS NOT ENABLING FOR SKILLED BIRTH ATTENDANCE

Our findings indicate that despite some awareness of best practices, staff are unable to implement these practices in settings with human resource shortages and managerial problems and where quality is not an explicit priority (III, IV). In their framework for SBA, Graham et al. (Graham et al., 2001) describe SBA as a result of skilled providers functioning in a setting conducive for appropriate care provision that they term as an ‘enabling environment’ for SBA. Our observations of delivery rooms reveal these not being conducive to safe and women friendly care, poor coordination amongst staff and gaps in the required infrastructure, material and human resources (IV). These findings are corroborated by interviews with staff (III, IV) that indicate problems importantly in the organisation of care and in the overall supervision and management of facilities. Problems with communication among staff between facilities and coordination of care are also indicated from our study of referral services (II). Our findings of referrals sent out from DHs for conditions to be managed at this level, although few and possibly due to deputation of obstetricians or anesthetist for conducting sterilization operations indicate negligence to ensuring facility preparedness for obstetric emergencies and could prove fatal for some women. Other systemic issue emerging from our study is persistent dysfunctional secondary level facilities leading to overcrowding of DHs that could contribute to reduced effectiveness of services at this level (II). There could possibly be other reasons for unnecessary referrals like staff fear being blamed by patients’ families and questioned by authorities in the event of adverse outcomes at their facility premises and hence attempt to evade responsibility in the face of life threatening emergencies (Sri et al., 2012). These findings indicate a culture of blaming individuals rather than a favoring work environment where facility teams try to perform at their best. Also findings indicate monitoring of services especially, as regards the quality of care provided, seems to be weak leading to continued compromise in it. For instance the bureaucratic use of the partograph in study III shows poor supervisory mechanisms. The poor ‘buy in’ to partograph use seems to be resulting from several training and managerial issues. The findings highlight the need of a conducive work environment for the use of a partograph (III) and appropriate care provision (III, IV). Overall our findings indicate that the structures, circumstances and work culture in the study facilities are not conducive to provision of skilled birth attendance.

This thesis offers important insights showing how systems and structures fail to ensure an ‘enabling environment’ for quality care. The JSY program in India was launched in the context of a health system reform that aimed to address the resource gaps and was therefore expected to provide the necessary enabling environment for the JSY to succeed. However our findings show much remains to be done on this front. It is important to highlight that in addition to required physical and human resources, provision of quality care requires leadership and addressing challenges to professional accountability and governance. Our findings indicate lacunae in, and at times missing, measures of accountability of the system to the users and also of professional accountability among the nurse-midwives.

Establishing accountability is a crucial determinant of the progress to improving maternal health, along with increasing coverage of key maternal health interventions, especially in low resource settings, as is concluded by a review of the global progress and challenges to improving maternal health (Requejo et al., 2011). Although scarce, literature indicates ‘a

systemic crisis of accountability’ in India (Posani and Aiyar, 2009) and hence there is increasing necessity of hybrid forms of accountability such as citizen led or social accountability. Landmark documents by the WHO (World Health Organization, 2011), the Commission on Social Determinants of Health (Marmot et al., 2008) and the World Bank suggest ‘social accountability’ as a key pathway to improved health, development and governance (Agarwal and Heltberg, 2009). Social accountability that refers to mobilization of communities to voice their concerns and assert their rights to health services in the context of social and systemic barriers undermining health (Murthy and Klugman, 2004) is seen as a tool to improve governance, increase development effectiveness and foster empowerment. Initiatives in India by civil society groups report mixed effects from informing marginalized communities and facilitating accountability for maternal health (George, 2003; Campbell and Scott, 2011; COPASAH). Community based monitoring of services is an accountability mechanism initiated during the NRHM, it has the potential to facilitate community –led action and help improve implementation of services (Garg and Laskar, 2010). In their account of processes and pathways supporting successful social accountability efforts and eventual service improvements in maternal health services in public health settings in Orissa state of India, Papp S et al. (Papp et al., 2013) portray the change in dynamics of the two-way relationship between users and providers of care and a movement away from a culture where women are viewed as passive recipients of whatever quality of care the health providers see fit to offer. They argue that efforts by social accountability programmes to change entrenched mindsets of providers, to spark a genuine sense of concern and to create an impetus for corrective action can create opportunities for improvement in service quality. Our findings seen in this light suggest social accountability could be a potentially important mechanism to build the enabling environment necessary for skilled birth attendance and quality care.

6.5 BALANCING SUPPLY AND DEMAND- QUALITY AND QUANTITY CONSIDERATIONS FOR JSY AND OTHER CASH TRANSFER PROGRAMS

Staff at JSY facilities reported the increased work load since the implementation of the JSY (III, IV). Secondary data show facility births have increased rapidly from 34.5% to 74.5% between 2005 and 2013 nationally, with the rise in MP during this period has been higher than in other provinces in the country – from 22.4% to 75.5%.

The role of the JSY cash transfer program in increasing facility births in India is highly recognized. However, the decline in maternal mortality remains to meet the expectations from the rise in facility births. The Indian situation resembles that of the Dominican Republic in 2000 where maternal mortality remained high despite near universal access to facility births (Miller et al., 2003) , possibly due to poor quality of care (Mavalankar,2003). Therefore while increasing the demand for services is important, and cash transfer programs can be useful measures for this, it is essential to ensure quality of services provided is acceptable as to achieve the intended impact on health outcomes. Although uncertainties around the measurement of MMR (Horton, 2014), as well as the proportion of institutional births, cannot be denied, our findings of poor staff competence at life-saving EmOC provision (I), poor quality of referral services (II), inappropriate routines of care (III, IV) indicate that chances of improving maternal and neonatal outcomes rapidly are small if these issues are not addressed. Further, the JSY program approach is focused around the intra-partum period when majority of maternal deaths occur; however other contextual considerations for maternal mortality reduction are important

too. For example, issues of adequate quality ante natal care need consideration. Malnutrition and prevalence of maternal anemia is high in this context. However, while facility births are rising, uptake of ANC that can determine outcomes of facility births especially in the event of intrapartum complications like haemorrhage or eclampsia, remains low. Unsafe abortion continues to contribute a large number of maternal deaths in India (8%); although higher proportion of women access facility care for birthing, access to safe abortion services seems to be a persistent problem (Chaturvedi et al., 2015). Thus the JSY program takes a narrow approach to reduce maternal mortality that is influenced by broader determinants of health and development. The JSY is an atypical CCT targeted at one time event as childbirth, whereas other CCT examples for maternal health in South Asia have been comprehensive programs including ANC and some post-partum care (Jehan et al., 2012).

Scott et al put forth the JSY example to draw lessons for global health agenda and highlight the need to prioritize both access and quality (Scott and Jha, 2014). A study from Nepal aiming to establish the relative importance of access and quality for the utilization of health services found pronounced relationship between overall structural quality of health posts and uptake of services. Based on findings from surveys in early 90s showing about six times higher adjusted odds of using some of the services in areas with better quality of services, they suggest investment in quality of health services is more important than further increases in their number (Acharya and Cleland, 2000). Our findings show a lack of attention to quality of care while much policy emphasis lay on increasing coverage of facility births. Literature includes papers reporting the JSY as an example of a cash transfer program that is unethical and violating rights of the people (Gopichandran et al., 2012). Similar concerns have been raised by Sri et al. in their review of maternal deaths in MP (Sri et al., 2012).

We therefore highlight that efforts aimed at increasing access like through CCTs should necessarily be complemented with improvements in the quality of care provided, without which only limited results can be achieved. A noteworthy example is provided by a study of the Oportunidades program in Mexico where investigators examine the pathways for the impact of the program on birth outcomes (Barber and Gertler, 2010). They modeled several potential contributors to program impact and concluded that the impact was mediated by quality of care and that it could solely explain the impact on outcomes.

Quality of care is a complex phenomenon and no single intervention is adequate to improve it. While our studies show the manifestations of poor quality in terms of problems with competence and practices, they importantly point to the limited accountability to users. These are larger issues that need systemic attention for correction. It is important to recognize that success with measures for providing good quality services in the JSY is conditional to understanding the health systems and organizational context in which the JSY is implemented. For instance, George A in a study from South India reports implicit quid-pro quo bargains that justify poor service delivery performance are more prevalent, though supportive supervision efforts are acknowledged and practiced (George, 2009). In a WHO commissioned meta-review to identify facilitators and barriers to improving quality of maternal health care in low income settings Nair et al. identify a lack of studies assessing the role of leadership in improving quality of care (Nair et al, 2014). The independent expert group formed by the Commission on Information and Accountability recommends a 'revolution in accountability' for improved maternal and newborn health (Hulton et al., 2014).

While the JSY, like other such cash transfer programs, has generated demand for services, the importance of generating demand for quality services needs a serious consideration. The role users can play in generating demand for quality services has been documented. As service users, women can play important roles in improving the process of care ranging from participants of care, definers of quality, and reformers of care, and their participation is essential to bring professional accountability (Donnabedian, 1992). Research suggests that addressing the invisibility, inferiority, and powerlessness of women accessing services could be potentially useful ways to improve maternal health services (Mumtaz et al., 2014). It is recognised that such measures demand a systemic approach and are beyond the scope of a narrowly focused cash transfer program. The study by Barber and Gertler (Barber and Gertler, 2010) who report better birth outcomes in Mexico's *Oportunidades* program investigated the pathways by which this was achieved and report that *Oportunidades* affected quality through empowering women with knowledge about the program content and skills and social support to negotiate better care. Health systems that have been successful at embedding a culture of quality respond to the demand side by capturing views and voices of users of both, public and private sector services (Klazienga, 2010).

The implementation of the JSY is a successful example of how cash transfer programs can increase coverage of services while also showing that merely increasing coverage is inadequate to achieve the desired health impact and that increasing effective coverage is crucial for this. Effective coverage of delivery care requires appropriate monitoring of labour and delivery to enable early recognition and appropriate treatment of obstetric complications. Our findings show inadequacies in such monitoring and hence the potential of high institutional birth coverage to translate into better health outcomes being unfulfilled. Hence the question for the Indian context is how to use the opportunity to improve maternal and neonatal outcomes. Indian situation is currently characterised by high maternal mortality, direct causes of maternal deaths predominate, access issues for some populations, but with a large shift to institutions for delivery care, characteristics that Souza et al. describe as those of countries in 'third stage of obstetric transition'. They describe this stage as complex, during which facility care assumes a greater role in maternal mortality reduction (Souza et al., 2014). Improving quality of facility care therefore ought to be a priority action in India.

Overall our conclusions lead to recommendations in line with those of Gaarder et al. (Gaarder et al., 2010) who reviewed evidence on impact of cash transfer programs on health outcomes and highlight the need to find a right balance between incentives, measures to improve quality of care and empowering users.

6.6 CONSIDERATIONS FOR QUALITY IMPROVEMENT

While access to health services is a concern in many parts of the developing world, a recent study estimates that there is also a considerable harm from adverse events during medical care—of the 43 million adverse events annually, two thirds occur in the LMICs. These findings draw attention to critically evaluating quality while improving access to care in LMICs (Jha et al., 2013). An assessment of quality of care is essentially an assessment of health systems performance. Therefore though this thesis is focused on quality of care in the JSY program, the findings can be considered suggestive of the performance of the health system in general. The availability of human and physical resources being a prerequisite for the provision of care, any

deficiencies in these aspects inevitably affect the provision of care. On the contrary, it is also important to consider that quality care is not a function merely of resource availability or their efficient use; in addition to resources, human factors, relationships and culture are important. While there are proximal factors that affect quality of care like resource availability, it is important to recognize the distal factors like human resource policies or medical/paramedical education generate the contexts for hazards in view of patient safety or quality care provision. Donabedian who described the popular the structure- process-outcomes framework for quality care, subsequently suggested the need to consider the factors that fuel the need to improve care. In a series of interviews given shortly before he died, Donabedian mentioned that though systems awareness and design are important for health professionals, these are only enabling mechanisms and not enough to produce quality services. This quote from one of the interviews clearly explains this: “It is the ethical dimensions of individuals that is essential to a system’s success. Ultimately, the secret of quality is love. You have to love your patient, you have to love your profession, you have to love your God. If you have love, you can then work backward to monitor and improve the system”(Mullan, 2001). This quote suggests frameworks and tools are helpful, but to spur those mechanisms into practice, a more human and emotional connection is required, perhaps one that appeals to personal and intrinsic motivations (Schein et al., 2010).

The quality in health care is influenced by the attitudes that affect not only staff behavior and practices but also expectations of patients and their tolerance to poor quality of care. A qualitative study of the culture of care in maternity hospitals in Afghanistan reveals how cultural values, social and family pressures influenced the motivation and priorities of staff and finds suboptimal perinatal care was partly a result of conflicting priorities of staff while the hospital culture mirrored the culture and values of the Afghan society. These findings suggest the need to understand the context specific pressures on staff for quality care to be delivered (Arnold et al., 2015). It is important to note that in the Indian public sector, staff face several problems with postings and transfer that are likely to affect their motivation to perform better (Schaaf and Freedman, 2015). The role of provider motivation in quality of care is clearly seen from a study by Das and Hammer in urban India where they find the same doctors to provide better care in the private sector than they did while working in the public hospitals, possibly owing to more individual effort in the private sector (Das and Hammer, 2005).

Thus clearly quality is more of an attitude and motivation issue. Hence assessing or improving quality needs to be underpinned by understanding of these factors- that quality improvement is alike social change and may require a series of iterative context specific interventions, actions and learning from those and that there could be problems when such a complex phenomenon as quality is reduced to checklists or rigid protocols without considering the context in which it will be applied.

In summary, quality of care in the JSY cash transfer program needs considerable improvement for the program success at increasing coverage of facility births to translate to reductions in maternal mortality. The large shift to facilities for childbirth offers a never before opportunity to improve maternal health outcomes in India.

6.7 METHODOLOGICAL CONSIDERATIONS

This section discusses the strengths and limitations of the studies in this thesis. The studies in this thesis address the knowledge gap regarding the quality of obstetric care in the context of the JSY cash transfer program in an Indian province. By studying crucial aspects of obstetric services in the program, these provide an insight into potential reasons for limited impact of the JSY cash transfer program on maternal mortality.

Studying the various aspects of care provision in an under developed province of India was not an easy task. Since there is no one simple or suitable method to study the quality of processes during care, well designed study procedures suitable for the context became important. One of the major strengths of this thesis is the use of a combination of both quantitative and qualitative research approaches. The use of established frameworks for the design and analysis of these is another strength of these studies.

A number of measures were taken to ensure trustworthiness of this research as per the applicable criteria- quantitative or qualitative. Truth value is the ability of the research to measure what it aims to measure by avoiding biases, defined as ‘internal validity’ in quantitative research. Research consistency - the likelihood of obtaining the same results if the study was repeated several times, is referred to as reliability in quantitative research. The quantitative data in papers I- III in this thesis was primary, it was collected from the study districts. I was personally involved in designing the tools, piloting, developing the standard operating procedures for data collection, training of data collectors, onsite supervision of data collection process and quality check and thus ensured data were fairly representative and of good quality. The trustworthiness of qualitative research depends on credibility (how well the research questions are captured), dependability (how the changes in the research process are taken into consideration), conformability (how well the interpretations are grounded in the data) and transferability (the extent of applicability of results to other settings). We followed measures to ensure trustworthiness in studies III and IV as described in detail below.

Before discussing the specific studies, it is important to note that one of the overall limitations of these studies was that we focused on one time assessments of quality of care, though these aspects are dynamic and some findings could differ with time and with other possible interventions during the study period. This denied us information on how quality of care might change during the implementation of the cash transfer program. Such information would have strengthened the basis for recommendations for quality improvement. However, the information generated in this study provides a good foundation for further studies on analyzing the influence of the program on the quality of care. We have collected data only on the provision of care, it would have been useful to also collect data on experiences of care from the users of the services. However it was not possible to encompass all aspects of quality of care in one thesis. Secondly the quantitative studies in this thesis are based on a cross sectional design, and given the limitation of quantitative cross sectional studies in providing conclusive evidence of causality, our findings need to be seen with this constraint.

Our study settings are the public sector facilities in MP (except for few private facilities in the referral study), and so the sample and population cannot be considered to be representative of the entire country. Also, India being a large and diverse country, only a large scale study conducted on a nationally representative sample can produce results generalizable to the whole

country. Although findings could vary between different provinces in India, we believe our findings are generalizable to the nine high maternal mortality provinces (that are the focus of the JSY), owing to similarities with regard to levels of socio-economic development, education, health system functioning, and implementation of the JSY.

In paper I, we assessed the validity of the vignettes qualitatively, it could be argued that quantitative assessment of validity would have been better assessment as it is a more explicit and objective method. However we ensured the composition of the expert team for the qualitative assessment of validity was appropriate representing a variety of clinical experiences. Reliability of our findings could be affected by the way of administration of the survey. Keeping this in mind, we had ensured that the approach was similar for all respondents and had standard information to provide if the respondents made any enquiries about the vignette presented. The inability of some respondents to express themselves in writing, even when they have made the right clinical judgment mentally, could result in an underestimation of staff competence. Hence we had ensured the responses required no more writing effort than is required in routine obstetric nursing practice, and so the possibility for such bias is remote. The invisible process of judgment and decision making is challenging to study; written vignettes, using experimentally controlled stimuli to elicit judgment, are better suited for such study than observations or interviews (Heverly et al., 1984).

In paper II, we did not have data on delivery outcomes of mothers referred out from study facilities. However the pattern is unlikely to be very different from those of mothers referred into study facilities and included in our study. For the spatial analysis, our assumption of van speed of 50 km/hour and hence 100 km distance being the equivalent to 2 hours of travel time, was arrived at from the triangulation of information from van drivers, nurses and our own experience of using these roads. Even if one was to assume this speed to be less or more by 10 km/hour, our results remain unchanged. In this part of our study on in-facility maternal deaths among users of referral services; it is not known if mothers arrived early on onset of complication or not and what modes of transport were used. We would argue though that once the mothers reach a health facility, the responsibility for care rests with the services including referral services and not with the users. This is in line with Knight et al. who caution against shifting the blame to users in situations when facilities are dysfunctional (Knight et al., 2013). Fourth, the staff at participating facilities could have reported reasons for referral differently leaving a potential for misclassification of referral indications in our descriptive results, although this non-differential does not affect results from our matched case control design.

Birth weight and congenital anomalies could be possible confounders not considered in our case control study; however we were limited by inability to obtain reliable data on these variables and suggest interpretation of our findings in this consideration. Also our study has wide CIs because of small numbers and our focus being inter facility referrals, we have not studied the family/community level in the referral chain. Our sample had 34 cases and 68 controls. Given that referrals were 50% in cases and 25% in controls, our study had a power of 47% at $\alpha = 0.05$. Therefore our results should be interpreted with this caution.

In paper III, although we report a low use of partographs, we were unable to conclude from the records if partograph use was recommended in all cases studied. There may be cases where actions other than partograph use, such as immediate referral or caesarean section, should be

followed. Although a possibility, this number is likely to be small, thus not affecting the trend of our results. We were limited by the quality of clinical records and unable to determine the proportion of women who arrived late in labour.

In qualitative studies (III, IV), we consistently followed measures to ensure trustworthiness in terms of credibility, dependability, transferability and conformability. My prolonged engagement whereby I was familiar with the context in which studies were undertaken was useful to ensure credibility; while there were also coauthors who questioned my interpretations and preliminary analysis. The guides developed for the interviews and observations in this thesis ensured data collection opportunities were similar in structure, although allowing for probing and observing other aspects not mentioned in the guide if any arise. I conducted all the interviews and observations (III, IV). In order to generate accounts of participants' views of the phenomenon through interviews, building rapport and mutual understanding are important. I used my previous knowledge and understanding during design, data collection and analysis. As I have been living in the same setting as of the study and share some of the social norms of the research participants, I could build rapport easily and use my experience in maternity care to build a good mutual understanding, but this may also have influenced the research. In qualitative research as knowledge is generated through interaction between the researcher and the study participants, it is important to discuss reflexivity that refers to how the researcher and the research process influence the findings. During the study I frequently reflected on my role and my pre understanding. My orientation to health systems research and quality of care might have influenced the research processes. To avoid this, I tried to be conscious of this and remain open to learn new things from the participants responses and observations. Continuous discussions with and feedback from my co-authors based in Sweden and UK guided me to view data from different perspectives.

Interview participants in study III and IV might be affected by social desirability thus altering their responses in the direction they might have perceived was desired by me like by appreciating the use of the partograph or certain delivery practices. It is possible that the interviewer who approves of a practice might happen to express his/her attitude or preference for it, which might then be mirrored in the response. We used data triangulation to ensure our results were not affected by these possibilities- in study III we combined the interview data with that from record reviews and vignette survey while in study IV the interview data was interpreted along with the data from observations. Investigator triangulation, referring to engagement of two or more researchers with different backgrounds to study a particular phenomenon, was part of these studies – the academic and cultural background, and nationality of the coauthors differed enriching the discussion around meaning of the findings.

In paper IV, we investigated provision of care in the JSY in real time and in a comprehensive way by combining both clinical and social science perspectives, which was a strength of the study. Using observation as a data collection tool allowed us to provide deeper insights into processes during intrapartum care that are difficult to assess after delivery. Although observation as a method has limitations, including subjectivity and limitations to feasibility, we have made the best effort at its use by following a scientific and systematic approach to produce credible findings. We have described factors that are likely to influence collection and interpretation of data namely the background of the observer and other researchers, the observer's role and level of participation, and structure and timing of observation. During the

data collection and analysis, we reflected on how our backgrounds and beliefs, such as being health care professionals, and women may influence what data was collected and how it has been interpreted. In order to reduce the influence of the observers' presence on participant behavior- the Hawthorne effect, visits were made to facilities before the observations were conducted, timing of facility visits was unannounced and observations were one of many activities conducted during the facility visits. Although we cannot rule out the Hawthorne effect in this study, we do not think that it existed to a significant extent as staff did not "change" negative practices, nor did they attempt to be more polite to women. We followed measures to increase trustworthiness and credibility such as using a pre-tested semi-structured guide and systematic piloting, selection of a range of representative facilities, random visits for observations and enrolling any consenting woman for the delivery observation, early transcription and confirmation of notes with a co-observer, triangulating delivery observations with subsequent staff interviews, and rigorous analysis by bringing multiple perspectives from co-authors.

The dependability of the findings was enhanced by following an emergent design and making need based changes to the study design when required (IV). The topic guide for the interviews was based on the key issues arising from the observations while it also allowed for probing and exploring any issues emerging during the interviews. We purposively selected interview respondents who would provide rich data on the practices of staff within their facility; however other possibly important perspectives from other actors like managers or bureaucrats dealing with human resources, may have been omitted. I re-visited the facilities where observations took place between September 2012 and October 2013 to conduct the interviews and so there was a time lag of between 2 days and 6 months between the observations and interviews. This could be seen as a weakness; however there were no contextual changes, such as new health care policies or projects, changes in workforce, in the districts during this time.

In both studies III and IV, agreement between the authors was attempted in the latter stages of analysis in order to ensure trustworthiness. This was by moving back and forth between the developed themes and the transcripts. My experience in qualitative research and the complementary backgrounds of my supervisors helped in strengthening the trustworthiness of data analysis and interpretation.

The transferability of findings refers to the extent to which the findings could be transferred to other settings. In all studies in this thesis, we have tried to clearly describe the context in which the studies were undertaken thereby allowing readers to make judgments of the relevance of the findings to other settings. In addition to rich description of the context, transferability was strengthened through providing a description of the participants, the data collection and analysis procedures and by providing quotations in the text representing a variety of facilities and respondents.

7 CONCLUSIONS

This chapter presents the conclusions from this thesis, recommendations and potential areas for future research.

7.1 CONCLUSIONS

Findings from studies conducted in Madhya Pradesh province indicate that the quality of care in the JSY program requires improvement. The four sub studies concluded:

- Competence of nurse midwives in the JSY program at providing first line emergency obstetric care needs improvement (I)
- Quality of referral services in the JSY program is poor- women who were referred were more likely to experience adverse birth outcomes, and there was a high number of maternal deaths despite spatial access to EmOC (II)
- Implementation and implementation fidelity of partograph use for monitoring labour in the JSY program requires strengthening- addressing problems with training and supervision, promoting staff 'buy in' to partograph use and conducive practice environment have the potential to improved use of the partograph (III).
- Care given during labour and delivery under the JSY program did not meet standards for skilled birth attendance; facilities lack the 'enabling environment' required for skilled birth attendance (IV).

7.2 RECOMMENDATIONS

Short to medium term:

- Improving the competence and performance of staff is urgent and crucial for desired improvements in maternal health outcomes. Use of appropriate training methods with adequate opportunities for well supervised practical training and on the job clinical supervision is recommended.
- Triage at referral facilities and preferential treatment to referred cases requiring emergency care or additional monitoring is required. Functional splits at referral hospitals where complicated cases are treated in separate wards by specially trained nurse-midwives while non-complicated births are handled by general nurse-midwives has the potential to improve outcomes in the current context of overloaded referral hospitals and bypassing of lower facility levels.
- Ensuring labour is appropriately monitored in health facilities is highly recommended. This would require staff 'buy in' to appropriate labour monitoring, improving their competence at monitoring and ensuring a supportive work environment.
- Identifying reasons for late arrival of women to facilities and encouraging early presentation in labour is recommended. ASHAs could play a key role in facilitating early arrival of women, if supported and motivated.
- Measures to improve accountability of the health system to provide quality care should be strengthened. Ensuring regular perinatal death reviews and near miss audits are conducted and these result in improvements in provision of care could be useful, as well as better recording and monitoring of referrals.

- Ensuring structures for quality are in place - adequate supplies are available, the required infrastructure is functional, and staff shortages are addressed is recommended.
- Adequate financial resourcing to implement these recommendations.
- **Long term:**
- Empowering users to demand quality services can play a useful role in promoting accountability of the health system.
- Quality services require a strong governance structure, without which, short term measures and other efforts to improve quality are unlikely to be sustained. Focused attention on strengthening governance could go a long way in improving quality of care.
- Promoting a culture of quality would require attitude building and role model setting during medical and paramedical education.

7.3 AREAS FOR FURTHER RESEARCH

- This thesis has investigated some aspects of quality of care in the JSY program in MP. However, quality of care being a multidimensional concept, there remain other aspects that could be investigated. Further research can investigate those aspects such as availability of physical resources and user expectations and experiences of services in the JSY program.
- These studies were conducted in MP province. Further investigations allowing comparison of quality of care in the JSY program in different provinces of India could be interesting and relevant for policy makers. Studying changes in the quality of care during the cash transfer program could also provide important evidence for decision making.
- Limited quality of clinical documentation did not allow studying more thoroughly the technical aspects of care provided like by conducting clinical audits; further research could investigate improving clinical documentation for quality of care. Generating data from clinical records prospectively while attempting improvements in record keeping could be a way to achieve this.
- Although this thesis identifies potential problems with the training of staff, there could be other factors influencing their competence and performance such as staff motivation, and government human resource policies. Further research could investigate the facilitators and barriers to performance of the staff.
- The initiation of community based monitoring of health services is a newer initiative in India which started with the JSY as part of the NRHM in 2005; investigating the implementation and effect of this social accountability mechanism on the quality of services for women could be useful.
- This thesis highlights the importance of organizational culture and supportive work environment for better performance of staff. Further research could explore local understanding of a supportive environment and how this could be realised.

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9 REFERENCES

- AbouZahr, C. (1998). Antepartum and postpartum haemorrhage. *Global Burden of Disease and Injury Series*, 3, 165-190.
- Abuya, T., Warren, C. E., Miller, N., Njuki, R., Ndwiga, C., Maranga, A., ...& Bellows, B. (2015). Exploring the Prevalence of Disrespect and Abuse during Childbirth in Kenya. *PLoS ONE* 10(4): e0123606.
- Acharya, L. B., & Cleland, J. (2000). Maternal and child health services in rural Nepal: does access or quality matter more?. *Health Policy and Planning*, 15(2), 223-29.
- Agarwal, S., & Heltberg, R. (2009). Scaling-up social accountability in World Bank operations.
- Alexander, C. S., & Becker, H. J. (1978). The use of vignettes in survey research. *Public opinion quarterly*, 42(1), 93-104.
- Ansong-Tornui, J., Armar-Klemesu, M., Arhinful, D., Penfold, S., & Hussein, J. (2007). Hospital based maternity care in Ghana-findings of a confidential enquiry into maternal deaths. *Ghana medical journal*, 41(3).
- Ariff, S., Soofi, S. B., Sadiq, K., Feroze, A. B., Khan, S., Jafarey, S. N., ...& Bhutta, Z. A. (2010). Evaluation of health workforce competence in maternal and neonatal issues in public health sector of Pakistan: an assessment of their training needs. *BMC health services research*, 10(1), 319.
- Arnold, R., Teijlingen, E., Ryan, K., & Holloway, I. (2015). Understanding Afghan healthcare providers: a qualitative study of the culture of care in a Kabul maternity hospital. *BJOG: An International Journal of Obstetrics & Gynaecology*, 122(2), 260-67.
- Auxiliary Nurse Midwives/Lady Health Visitors and Staff Nurses. Government of India, New Delhi.
- Bailey, P., Lobis, S., Maine, D., & Fortney, J. (2009). *Monitoring emergency obstetric care: a handbook*. World Health Organization.
- Baird, S., Ferreira, F. H., Özler, B., & Woolcock, M. (2013). Relative effectiveness of conditional and unconditional cash transfers for schooling outcomes in developing countries: a systematic review. *Campbell Systematic Reviews*, 9(8).
- Bajpai, N., Sachs, J. D., & Volavka, N. H. (2004). Reaching the Millennium Development Goals in South Asia. Working paper 17, Center on Globalization and Sustainable Development, Columbia University.
- Barber, S. L., & Gertler, P. J. (2010). Empowering women: how Mexico's conditional cash transfer programme raised prenatal care quality and birth weight. *Journal of Development Effectiveness*, 2(1), 51-73.
- Baru, R., Acharya, A., Acharya, S., Shiva Kumar, A. K., & Nagaraj, K. (2010). Inequities in access to health services in India: caste, class and region. *Economic and Political Weekly*, 45(38), 49-58.
- Bowser, D., & Hill, K. (2010). Exploring evidence for disrespect and abuse in facility-based childbirth. *Boston: USAID-TRAction Project, Harvard School of Public Health*.

- Bruce, J. (1990). Fundamental elements of the quality of care: a simple framework. *Studies in family planning*, 61-91.
- Campbell, C., & Scott, K. (2011). Mediated health campaigns: from information to social change. *The social psychology of communication*, 266-83.
- Campbell, O. M., Graham, W. J., & Lancet Maternal Survival Series steering group. (2006). Strategies for reducing maternal mortality: getting on with what works. *Lancet*, 368(9543), 1284-1299.
- Carroll, C., Patterson, M., Wood, S., Booth, A., Rick, J., & Balain, S. (2007). A conceptual framework for implementation fidelity. *Implement Sci*, 2(1), 40.
- Chaturvedi, S., Ali, S., Randive, B., Sabde, Y., Diwan, V., & De Costa, A. (2015). Availability and distribution of safe abortion services in rural areas: a facility assessment study in Madhya Pradesh, India. *Global Health Action*, 8, 26346.
- Clemens, M. A., Kenny, C. J., & Moss, T. J. (2007). The trouble with the MDGs: confronting expectations of aid and development success. *World development*, 35(5), 735-751.
- COPASAH-Community of Practitioners on Accountability and Social Action in Health. Available online from <http://www.copasah.net/knowledge-generation.html>.
- Das, J., & Hammer, J. (2005). Which doctor? Combining vignettes and item response to measure clinical competence. *Journal of Development Economics*, 78(2), 348-383.
- Das, J., Holla, A., Das, V., Mohanan, M., Tabak, D., & Chan, B. (2012). In urban and rural India, a standardized patient study showed low levels of provider training and huge quality gaps. *Health Affairs*, 31(12), 2774-2784.
- Dogba, M., Fournier, P., Dumont, A., Zunzunegui, M. V., Tourigny, C., & Berthe-Cisse, S. (2011). Mother and newborn survival according to point of entry and type of human resources in a maternal referral system in Kayes (Mali). *Reprod Health*, 8(1), 13.
- Donabedian, A. (1965). Evaluating the quality of medical care. *Milbank; Memorial Fund Quarterly*.
- Donabedian, A. (1988). The quality of care: How can it be assessed?. *JAMA*, 260(12), 1743-48.
- Donabedian, A. (1992). The Lichfield Lecture. Quality assurance in health care: consumers' role. *Quality in health care*, 1(4), 247.
- Duysburgh, E., Zhang, W. H., Ye, M., Williams, A., Massawe, S., Sie, A., ...& Temmerman, M. (2013). Quality of antenatal and childbirth care in selected rural health facilities in Burkina Faso, Ghana and Tanzania: similar finding. *Tropical Medicine & International Health*, 18(5), 534-547.
- Englund, L., Tibblin, G., & Svärdsudd, K. (2000). Variations in sick-listing practice among male and female physicians of different specialties based on case vignettes. *Scandinavian journal of primary health care*, 18(1), 48-52.

- Epstein, S. A., Gonzales, J. J., Weinfurt, K., Boekeloo, B., Yuan, N., & Chase, G. (2001). Are psychiatrists' characteristics related to how they care for depression in the medically ill?: Results from a National Case-Vignette Survey. *Psychosomatics*, 42(6), 482-89.
- Fernald, L. C., Gertler, P. J., & Neufeld, L. M. (2008). Role of cash in conditional cash transfer programmes for child health, growth, and development: an analysis of Mexico's Oportunidades. *Lancet*, 371(9615), 828-37.
- Fiszbein, A., Schady, N. R., & Ferreira, F. H. (2009). *Conditional cash transfers: reducing present and future poverty*. World Bank Publications.
- Freedman, L. P., & Kruk, M. E. (2014). Disrespect and abuse of women in childbirth: challenging the global quality and accountability agendas. *Lancet*, 384(9948), e42-e44.
- Frimpong, J. A., HELLERINGER, S., Awoonor-Williams, J. K., Yeji, F., & Phillips, J. F. (2011). Does supervision improve health worker productivity? Evidence from the Upper East Region of Ghana. *Tropical Medicine & International Health*, 16(10), 1225-1233.
- Gaarder, M. M., Glassman, A., & Todd, J. E. (2010). Conditional cash transfers and health: unpacking the causal chain. *Journal of development effectiveness*, 2 (1), 6-50.
- Garg, S., & Laskar, A. R. (2010). Community-based monitoring: Key to success of national health programs. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*, 35(2), 214.
- George, A. (2003). Using accountability to improve reproductive health care. *Reproductive health matters*, 11(21), 161-170.
- George, A. (2007). Persistence of high maternal mortality in Koppal district, Karnataka, India: observed service delivery constraints. *Reproductive health matters*, 15(30), 91-102.
- George, A. (2009). 'By papers and pens, you can only do so much': views about accountability and human resource management from Indian government health administrators and workers. *The International journal of health planning and management*, 24(3), 205-24.
- George, A. (2003). Accountability in Health Services: Transforming Relationships and Contexts. Indian Institute of Management, Bangalore-Harvard Center for Population and Development Studies HCPDS; *Contract*, (1).
- Godlee, F. (2009). Effective, safe, and a good patient experience. *BMJ*, 339.
- Government of India. (2006). Approach Paper to the Eleventh Five-Year Plan. New Delhi: Planning Commission, Government of India.
- Gopichandran, V., & Chetlapalli, S. K. (2012). Conditional cash transfer to promote institutional deliveries in India: toward a sustainable ethical model to achieve MDG 5A. *Public Health Ethics*, 5(2), 173-80.
- Graham, W. J., & Varghese, B. (2012). Quality, quality, quality: gaps in the continuum of care. *The Lancet*, 379(9811), e5-e6.
- Graham, W. J., Bell, J. S., & Bullough, C. H. (2001). Can skilled attendance at delivery reduce maternal mortality in developing countries. *Safe motherhood strategies: a review of the evidence*, 17, 97-130.

Graham, W. J., McCaw-Binns, A., & Munjanja, S. (2013). Translating coverage gains into health gains for all women and children: the quality care opportunity. *PLoS Med* 10(1): e1001368.

Green, J., & Thorogood, N. (2013a). *Observational Method- Qualitative methods for health research*. Sage. New Delhi.

Green, J., & Thorogood, N. (2013b). *In-depth interviews - Qualitative methods for health research*. Sage. New Delhi.

Gupta, S. K., Pal, D. K., Tiwari, R., Garg, R., Shrivastava, A. K., Sarawagi, R., ... & Lahariya, C. (2012). Impact of Janani Suraksha Yojana on institutional delivery rate and maternal morbidity and mortality: an observational study in India. *Journal of Health, Population, and Nutrition*, 30(4), 464.

Harvey, S. A., Blandón, Y. C. W., McCaw-Binns, A., Sandino, I., Urbina, L., Rodríguez, C., ... & Djibrina, S. (2007). Are skilled birth attendants really skilled? A measurement method, some disturbing results and a potential way forward. *Bulletin of the World Health Organization*, 85(10), 783-790.

Heverly, M. A., Fitt, D. X., & Newman, F. L. (1984). Constructing case vignettes for evaluating clinical judgment: an empirical model. *Evaluation and Program Planning*, 7(1), 45-55.

Hogan, M. C., Foreman, K. J., Naghavi, M., Ahn, S. Y., Wang, M., Makela, S. M., ... & Murray, C. J. (2010). Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5. *The Lancet*, 375(9726), 1609-1623.

Horton, R. (2014). Offline: How many women die in India?. *Lancet*, 383(9931), 1792.

Hughes, R., & Huby, M. (2002). The application of vignettes in social and nursing research. *Journal of advanced nursing*, 37(4), 382-86.

Hulton, L., Matthews, Z., & Stones, R. W. (2000). A framework for the evaluation of quality of care in maternity services. Southampton.

Hulton, L., Matthews, Z., Martin-Hilber, A., Adanu, R., Ferla, C., Getachew, A., ... & Yilla, M. (2014). Using evidence to drive action: A “revolution in accountability” to implement quality care for better maternal and newborn health in Africa. *International Journal of Gynecology & Obstetrics*, 127(1), 96-101.

Hussein, J., Braunholtz, D., & D'Ambruoso, L. (2008). Maternal health in the year 2076. *The Lancet*, 371(9608), 203-04.

Ijadunola, K. T., Ijadunola, M. Y., Esimai, O. A., & Abiona, T. C. (2010). New paradigm old thinking: the case for emergency obstetric care in the prevention of maternal mortality in Nigeria. *BMC women's health*, 10(1), 6.

International Confederation of Midwives. (2010). *Essential Competencies for Basic Midwifery Practice*.

International Institute for Population Sciences. (2010). *District Level Household and Facility Survey (DLHS-3), 2007- 08: Mumbai, India*.

Islam, M. T., Haque, Y. A., Waxman, R., & Bhuiyan, A. B. (2006). Implementation of emergency obstetric care training in Bangladesh: lessons learned. *Reproductive Health Matters*, 14(27), 61-72.

- Iyengar, K., Jain, M., Thomas, S., Dashora, K., Liu, W., Saini, P., ...& Iyengar, S. (2014). Adherence to evidence based care practices for childbirth before and after a quality improvement intervention in health facilities of Rajasthan, India. *BMC pregnancy and childbirth*, 14(1), 270.
- Jahn, A., & De Brouwere, V. (2000). Referral in pregnancy and childbirth: concepts and strategies. *Safe motherhood strategies: a review of the evidence*. Antwerp: ITG press.
- Jehan, K., Sidney, K., Smith, H., & De Costa, A. (2012). Improving access to maternity services: an overview of cash transfer and voucher schemes in South Asia. *Reproductive health matters*, 20(39), 142-154.
- Jha, A. K., Larizgoitia, I., Audera-Lopez, C., Prasopa-Plaizier, N., Waters, H., & Bates, D. W. (2013). The global burden of unsafe medical care: analytic modelling of observational studies. *BMJ quality & safety*, 22(10), 809-815.
- Johnson, F. A., Padmadas, S. S., & Matthews, Z. (2013). Are women deciding against home births in low and middle income countries?. *PloS one*, 8(6), e65527.
- Kapur, A. (2013). National Rural Health Mission (NRHM). *Budget Briefs, GOI, 14*. New Delhi.
- Kashyap, S. C. (1994). *Our Constitution: An introduction to India's Constitution and constitutional law*. NBT, India.
- Khalil, K., Sholkamy, H., Hassanein, N., Cherine, M., Elnoury, A., Mohsen, L., ...& Sheikha, S. (2005). Routines in facility-based maternity care: Evidence from the Arab World. *BJOG*, 112(9), 1270-6.
- Kim, Y. M., Mungia, J., Faqir, M., Ansari, N., & Evans, C. (2012). Patterns in training, knowledge, and performance of skilled birth attendants providing emergency obstetric and newborn care in Afghanistan. *International Journal of Gynecology & Obstetrics*, 119(2), 125-129.
- Kirkwood, B. R., & Sterne, J. A. C. (2003). Matched studies. *Essential medical statistics*, 214-226.
- Klazienga, N. (2010). Improving Value in Health Care: Measuring Quality.
- Knight, H. E., Self, A., & Kennedy, S. H. (2013). Why are women dying when they reach hospital on time? A systematic review of the 'third delay'. *PLoS One* 8: e63846.
- Koblinsky, M., Chowdhury, M. E., Moran, A., & Ronsmans, C. (2012). Maternal morbidity and disability and their consequences: neglected agenda in maternal health. *Journal of health, population, and nutrition*, 30(2), 124.
- Koblinsky, M., Matthews, Z., Hussein, J., Mavalankar, D., Mridha, M. K., Anwar, I., ...& Lancet Maternal Survival Series Steering Group. (2006). Going to scale with professional skilled care. *Lancet*, 368(9544), 1377-86.
- Kujawski, S., Mbaruku, G., Freedman, L. P., Ramsey, K., Moyo, W., & Kruk, M. E. (2015). Association Between Disrespect and Abuse During Childbirth and Women's Confidence in Health Facilities in Tanzania. *Maternal and child health journal*, 1-8.
- Lagarde, M., Haines, A., & Palmer, N. (2007). Conditional cash transfers for improving uptake of health interventions in low-and middle-income countries: a systematic review. *JAMA*, 298(16), 1900-10.
- Lancet, (2015). Achieving respectful care for women and babies. *Lancet*, 385(9976), 1366.

- Lavender, D. T., Omoni, G., Lee, K., Wakasiaki, S., Campbell, M., Watiti, J., & Mathai, M. (2013). A pilot quasi-experimental study to determine the feasibility of implementing a partograph e-learning tool for student midwife training in Nairobi. *Midwifery*, 29(8), 876-84.
- Lim, S. S., Dandona, L., Hoisington, J. A., James, S. L., Hogan, M. C., & Gakidou, E. (2010). India's Janani Suraksha Yojana, a conditional cash transfer programme to increase births in health facilities: an impact evaluation. *Lancet*, 375(9730), 2009-23.
- Lindert, K., Linder, A., Hobbs, J., & De la Brière, B. (2007). The nuts and bolts of Brazil's BolsaFamília Program: implementing conditional cash transfers in a decentralized context. SP Discussion paper no.0709. World Bank.
- Lohr, K. N. (Ed.). (1990). *Medicare: A Strategy for Quality Assurance* (Vol. 1). National Academies Press.
- Macro-International, I. I. P. S. (2007). National Family Health Survey (NFHS-3), 2005–06: India: Volume I. *Mumbai: IIPS*.
- Marmot, M., Friel, S., Bell, R., Houweling, T. A., Taylor, S., & Commission on Social Determinants of Health. (2008). Closing the gap in a generation: health equity through action on the social determinants of health. *The Lancet*, 372 (9650), 1661-69.
- Marshall, C., & Hill, P. S. (2014). Ten best resources on conditional cash transfers. *Health policy and planning*, czu051.
- Mavalankar, D. (2003). Quality of care in institutional deliveries: the paradox of the Dominican Republic: a commentary on management. *International Journal of Gynecology & Obstetrics*, 82(1), 107-10.
- Mavalankar, D., Vora, K., & Sharma, B. (2010). The midwifery role of the auxiliary nurse midwife: the effect of policy and programmatic changes. *Health Providers in India: On the Frontlines of Change*. New Delhi: Routledge.
- Mazumdar, S., Mills, A. J., & Powell-Jackson, T. (2012). Financial incentives in health: New evidence from India's Janani Suraksha Yojana.
- McClure, E. M., Pasha, O., Goudar, S. S., Chomba, E., Garces, A., Tshefu, A., ...& Goldenberg, R. L. (2011). Epidemiology of stillbirth in low-middle income countries: A Global Network Study. *Acta obstetrica et gynecologica Scandinavica*, 90(12), 1379-85.
- McMahon, S. A., George, A. S., Chebet, J. J., Mosha, I. H., Mpembeni, R. N., & Winch, P. J. (2014). Experiences of and responses to disrespectful maternity care and abuse during childbirth; a qualitative study with women and men in Morogoro Region, Tanzania. *BMC pregnancy and childbirth*, 14(1), 268.
- Merali, H. S., Lipsitz, S., Hevelone, N., Gawande, A. A., Lashofer, A., Agrawal, P., & Spector, J. (2014). Audit-identified avoidable factors in maternal and perinatal deaths in low resource settings: a systematic review. *BMC pregnancy and childbirth*, 14(1), 280.
- Miller, G. E. (1990). The assessment of clinical skills/competence/performance. *Academic medicine*, 65(9), S63-7.
- Miller, S., & Lalonde, A. (2015). The global epidemic of abuse and disrespect during childbirth: History, evidence, interventions, and FIGO's mother– baby friendly birthing facilities initiative. *International Journal of Gynecology & Obstetrics*. 128, (2), <http://dx.doi.org/10.1016/j.ijgo.2015.02.005>

Miller, S., Cordero, M., Coleman, A. L., Figueroa, J., Brito-Anderson, S., Dabagh, R., ...& Nunez, M. (2003). Quality of care in institutionalized deliveries: the paradox of the Dominican Republic. *International Journal of Gynecology & Obstetrics*, 82(1), 89-103.

Ministry of Health and Family Welfare, 2012. Rural Health Statistics. Government of India, New Delhi. Available at: <http://nrhm.gov.in/nrhm-updates/372-rhs-2012.html>.

Ministry of Health and Family Welfare. (2000). National Population Policy. Government of India, New Delhi.

Ministry of Health and Family Welfare. (2002). National Health Policy. Government of India, New Delhi.

Ministry of Health and Family Welfare. (2005a). Financing and Delivery of Health Care Services in India. National Commission on Macroeconomics and Health, Government of India, New Delhi.

Ministry of Health and Family Welfare. (2005b). National Rural Health Mission (2005-12): Mission Document. Government of India, New Delhi.

Ministry of Health and Family Welfare. (2006). Janani Suraksha Yojana: Revised Guidelines for Implementation. Government of India, New Delhi.

Ministry of Health and Family welfare. (2008). National training strategy for in-service training under the National Rural Health Mission. Government of India, New Delhi.

Ministry of Health and Family Welfare. (2010). Skilled Birth Attendance-A Handbook for Auxiliary Nurse Midwives/Lady Health Visitors and Staff Nurses. Government of India, New Delhi.

Ministry of Health and Family Welfare. (2012). Rural Health Statistics. Government of India, New Delhi. Available at: <http://nrhm.gov.in/nrhm-updates/372-rhs-2012.html>.

Ministry of Health and Family Welfare. (2013). Strengthening Pre-service Education for the nursing and midwifery cadre in India. Operational Guidelines. Government of India, New Delhi.

Ministry of Health and Family Welfare. (2015a). Executive Summary of NRHM programme. Government of India, New Delhi.

Ministry of Health and Family Welfare. (2015b). National Health Mission-Common Review Mission. Government of India, New Delhi.

Ministry of Health and Family Welfare. (2010). Skilled Birth Attendance-A Handbook for Auxiliary Nurse Midwives/Lady Health Visitors and Staff Nurses. Government of India, New Delhi.

Ministry of Women and Child Development. (2001). National Policy for Empowerment of Women. Government of India, New Delhi.

Moodley, J. (2000). A review of maternal deaths in South Africa during 1998. *South Afr Med J* 90(4): 367-73.

Morita, T., Akechi, T., Sugawara, Y., Chihara, S., & Uchitomi, Y. (2002). Practices and attitudes of Japanese oncologists and palliative care physicians concerning terminal sedation: a nationwide survey. *Journal of Clinical Oncology*, 20(3), 758-64.

Mullan F 2001- Mullan F: A founder of quality assessment encounters a troubled system firsthand. *Health Aff* 20:137-141, 2001).

- Mumtaz, Z., Levay, A., Bhatti, A., & Salway, S. (2015). Good on paper: the gap between programme theory and real-world context in Pakistan's Community Midwife programme. *BJOG: An International Journal of Obstetrics & Gynaecology*, 122(2), 249-58.
- Mumtaz, Z., Salway, S., Bhatti, A., & McIntyre, L. (2014). Addressing invisibility, inferiority, and powerlessness to achieve gains in maternal health for ultra-poor women. *Lancet*, 383(9922), 1095-97.
- Murthy, R. K., & Klugman, B. (2004). Service accountability and community participation in the context of health sector reforms in Asia: implications for sexual and reproductive health services. *Health Policy and Planning*, 19(suppl 1), i78-i86.
- Nagpal, J., Sachdeva, A., Sengupta Dhar, R., Bhargava, V. L., & Bhartia, A. (2015). Widespread non-adherence to evidence-based maternity care guidelines: a population-based cluster randomised household survey. *BJOG: An International Journal of Obstetrics & Gynaecology*, 122(2), 238-47.
- Nair, M., Yoshida, S., Lambrechts, T., Boschi-Pinto, C., Bose, K., Mason, E. M., & Mathai, M. (2014). Facilitators and barriers to quality of care in maternal, newborn and child health: a global situational analysis through metareview. *BMJ open*, 4(5), e004749.
- Okafor, I. I., Ugwu, E. O., & Obi, S. N. (2015). Disrespect and abuse during facility-based childbirth in a low-income country. *International Journal of Gynecology & Obstetrics*, 128(2), 110-113.
- Øvretveit, J. (2001). Quality evaluation and indicator comparison in health care. *The International journal of health planning and management*, 16(3), 229-241.
- Ovretveit, J., (1992). *Health Service Quality. An introduction to quality methods for health services*. Blackwell Scientific Publications.
- Papp, S. A., Gogoi, A., & Campbell, C. (2013). Improving maternal health through social accountability: A case study from Orissa, India. *Global public health*, 8(4), 449-64.
- Pathmanathan, I., & Liljestrand, J. (Eds.). (2003). *Investing in maternal health: learning from Malaysia and Sri Lanka*. World Bank Publications.
- Peabody, J. W., Luck, J., Glassman, P., Dresselhaus, T. R., & Lee, M. (2000). Comparison of vignettes, standardized patients, and chart abstraction: a prospective validation study of 3 methods for measuring quality. *JAMA*, 283 (13), 1715-22.
- Peabody, J. W., Luck, J., Glassman, P., Jain, S., Hansen, J., Spell, M., & Lee, M. (2004). Measuring the quality of physician practice by using clinical vignettes: a prospective validation study. *Annals of Internal Medicine*, 141(10), 771-80.
- Peabody, J. W., Tozija, F., Munoz, J. A., Nordyke, R. J., & Luck, J. (2004). Using vignettes to compare the quality of clinical care variation in economically divergent countries. *Health services research*, 39(6p2), 1951-70.
- Posani, B., & Aiyar, Y. (2009). *State of accountability: evolution, practice and emerging questions in public accountability in India* (No. 2). AI Working Paper.
- Randive, B., Diwan, V., & De Costa, A. (2013). India's conditional cash transfer programme (the JSY) to promote institutional birth: is there an association between institutional birth proportion and maternal mortality. *PloS one*, 8(6), e67452.

- Randive, B., San Sebastian, M., De Costa, A., & Lindholm, L. (2014). Inequalities in institutional delivery uptake and maternal mortality reduction in the context of cash incentive program, Janani Suraksha Yojana: Results from nine states in India. *Social Science & Medicine*, 123, 1-6.
- Rao, K. D., Sundararaman, T., Bhatnagar, A., Gupta, G., Kokho, P., & Jain, K. (2013). Which doctor for primary health care? Quality of care and non-physician clinicians in India. *Social science & medicine*, 84, 30-34.
- Registrar General of India, (2006). Sample Registration System: Maternal Mortality in India 1997-2003; Trends, Causes and Risk Factors, Sample Registration System. Government of India, New Delhi
- Registrar General of India. (2013). Special Bulletin on Maternal Mortality in India 2010-12, Sample Registration System. Government of India, New Delhi
- Rehnström, U., Khanna, R., Kar, M. (2010). Strengthening Midwifery and Emergency Obstetric Care (EmOC) services in India. SIDA review.
- Renfrew, M. J., McFadden, A., Bastos, M. H., Campbell, J., Channon, A. A., Cheung, N. F., ...& Declercq, E. (2014). Midwifery and quality care: findings from a new evidence-informed framework for maternal and newborn care. *The Lancet*, 384(9948), 1129-45.
- Requejo, J. H., Merialdi, M., & Bustreo, F. (2011). Improving global maternal health: progress, challenges, and promise. *Current Opinion in Obstetrics and Gynecology*, 23(6), 465-70.
- Ritchie, J., Spencer, L., & O'Connor, W. (2003). Carrying out qualitative analysis. *Qualitative research practice: A guide for social science students and researchers*, 219-62.
- Ronsmans, C., Graham, W. J., & Lancet Maternal Survival Series steering group. (2006). Maternal mortality: who, when, where, and why. *The Lancet*, 368(9542), 1189-1200.
- Schaaf, M., & Freedman, L. P. (2015). Unmasking the open secret of posting and transfer practices in the health sector. *Health policy and planning*, 30(1), 121-30.
- Schein EH: Three cultures of management: The key to organizational learning, in Bertagni B, La Rosa M, Salvetti F (eds): *Glocal Working. Living and Working Across the World With Cultural Intelligence*. Milan, Italy, Franco Angeli, 2010, 37-58).
- Scott, K. W., & Jha, A. K. (2014). Putting quality on the global health agenda. *New England Journal of Medicine*, 371(1), 3-5.
- Sharma, B. (2014). Preparing midwives as a human resource for maternal health: pre-service education and scope of practice in Gujarat, India. PhD thesis 2014, Karolinska Institutet, Stockholm, Sweden.
- Sharma, B., Johansson, E., Prakasamma, M., Mavalankar, D., & Christensson, K. (2013). Midwifery scope of practice among staff nurses: A grounded theory study in Gujarat, India. *Midwifery*, 29(6), 628-36.
- Souza, J. P., Tunçalp, Ö., Vogel, J. P., Bohren, M., Widmer, M., Oladapo, O. T., ... & Temmerman, M. (2014). Obstetric transition: the pathway towards ending preventable maternal deaths. *BJOG: An International Journal of Obstetrics & Gynaecology*, 121(s1), 1-4.
- Sri, B., Sarojini, N., & Khanna, R. (2012). An investigation of maternal deaths following public protests in a tribal district of Madhya Pradesh, central India. *Reproductive Health Matters*, 20(39), 11-20.

- Starrs, A. M. (2006). Safe motherhood initiative: 20 years and counting. *Lancet*, 368(9542), 1130-32.
- Styles, M., Cheyne, H., O'Carroll, R., Greig, F., Dagge-Bell, F., & Niven, C. (2011). The Scottish Trial of Refer or Keep (the STORK study): midwives' intrapartum decision making. *Midwifery*, 27(1), 104-11.
- Thaddeus, S., & Maine, D. (1994). Too far to walk: maternal mortality in context. *Social science & medicine*, 38(8), 1091-1110.
- Therese, D., Odile, A. T., Valérie, G. K., Patrice, B., Simon, C., & Carine, R. (2007). Quality of normal delivery care in Côte d'Ivoire. *African Journal of Reproductive Health*, 22-32.
- Tunçalp, Ö., Were, W. M., MacLennan, C., Oladapo, O. T., Gülmezoglu, A. M., Bahl, R., ... & Bustreo, F. (2015). Quality of care for pregnant women and newborns—the WHO vision. *BJOG: An International Journal of Obstetrics & Gynaecology*, 122 (8), 1045-49.
- UNICEF, India. (2010). Coverage evaluation survey 2009. *New Delhi: United Nations Children Fund*.
- UNICEF. (2008). Maternal and perinatal death inquiry and response: Empowering communities to avert maternal deaths in India. *New Delhi: UNICEF*.
- United Nation. (2000). United Nations Millennium Declaration: Resolution. New York.
- United Nations Human Rights Council. (2009). Resolution 11/8. Preventable maternal mortality and morbidity and human rights, dated 17 June 2009. United Nations, New York.
- United Nations Population Fund-India. (2009). Concurrent Assessment of Janani Suraksha Yojana (JSY) in Selected States: Bihar, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh. United Nations Population Fund-India, New Delhi
- United Nations. (2014). Millennium Development Goal Report. New York..
- Valencia Lomelí, E. (2008). Conditional Cash Transfers as Social Policy in Latin America: An Assessment of their Contributions and Limitations. *Annu. Rev. Sociol*, 34, 475-499.
- Wilson, L., Goldsmith, P. (1995) Quality and its measurements. In Wilson L and Goldsmith P (Eds) *Quality Management in Health Care*, McGraw-Hill, Sydney, Australia, 229-258.
- World Bank. (1997). India -Child Survival and Safe Motherhood Project, World Bank, Washington DC,
Available: <http://documents.worldbank.org/curated/en/1997/03/731996/india-child-survival-safe-motherhood-project> Accessed 2012 October 1
- World Health Organization, & UNICEF. (1999). *Reduction of maternal mortality: a joint WHO/UNFPA/UNICEF/World Bank Statement*. World Health Organization.
- World Health Organization. (1996). Care in normal birth: a practical guide. Report of a Technical Working Group. Geneva. *Unpublished document WHO/FRH/MSM/96.24*.
- World Health Organization. (2004). Making pregnancy safer: the critical role of the skilled attendant: a joint statement by WHO, ICM and FIGO. Geneva.
- World Health Organization. (2005). The World health report: 2005: make every mother and child count: overview. Geneva: World Health Organization.

World Health Organization. (2011). Keeping promises, measuring results: commission on information and accountability for women's and children's health. Geneva: World Health Organization.

World Health Organization. (2012). United Nations Children's Fund, United Nations Population Fund, & World Bank. Trends in maternal mortality 1990 to 2010. Geneva: World Health Organization.

World Health Organization. (2014a). Trends in maternal mortality: 1990 to 2013. Estimates by WHO, UNICEF, *UNFPA, the World Bank and the United Nations Population Division*. Geneva, World Health Organization. <http://apps.who.int/iris/bitstream/10665/112682>, 2.

World Health Organization. (2014b). Every newborn: an action plan to end preventable deaths. www.internationalmidwives.org/taskforces/globalstandards

World Health Organization. (2014c). The prevention and elimination of disrespect and abuse during facility-based childbirth: WHO statement.